JPRS 80549

12 April 1982

USSR REPORT

ENERGY

No. 96

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ELECTRIC POWER

SHEVCHENKO BREEDER REACTOR BASIS OF REGIONAL DEVELOPMENT

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 6 January 1982 carries on page 2 an 1,800-word article by S. Bayzhanov, Z. Saqiev and S. Khaydarov, the second of a series of five "Letters From the Mangyshlak Territorial-Production Complex," on the Shevchenko breeder reactor. The Shevchenko Atomic Electrical Station is world famous and is a fast neutron or breeder reactor that converts uranium-238 into plutonium-237, in addition to providing electrical power and drinking water.

The authors discuss Soviet nuclear power in general, noting the enormous advantages of clean nuclear power over polluting chemical energy that is based on dwindling fuel resources and the tremendous leaps made in nuclear power both in the world and in the Soviet Union over the approximately 25 years of its existence. Goals of the Soviet nuclear power industry: 1) a controlled thermonuclear reaction, 2) thermo-nuclear electrical power stations, 3) nuclear magnetohydrodynamic generators, 4) new processes for obtaining energy from the fission of heavy elements and 5) new methods for the synthesis of lighter elements, and see the Shevchenko reactor as a major advance along the road to full realization of the nuclear potential.

Turning to the Shevchenko Station itself, the authors underscore its symbolic significance as an expression of the whole industry and its importance for an entire region that has developed rapidly in an economically and ecologically advantageous manner. Electrical power produced by Soviet nuclear plants will reach 220-225 million kilowatt hours by 1985. Considerable effort is being made at Shevchenko and other local stations to increase generating capacities and refine production technology.

ATOMIC POWER PROVIDES FRESH WATER IN NEW CITY OF SHEVCHENKO

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 5 January 1982 carries on page 2 a 1,900-word article by S. Bayzhanov, Z. Saqiev and S. Khaydarov, the first of five "Letters From the Mangyshlak Territorial-Production Complex," on the new, planned city of Shevchenko, an oblast and regional development center. Shevchenko City is some 20 years old and has grown up in difficult environmental conditions beside the Caspian in dry, wind-swept desert steppe region, where local inhabitants once lived in primitive subterranean huts. In spite of such difficulties, prize winning architects, who have closely cooperated with builders in such things as extensive use of local building materials, have not just created a city but a well-planned completely modern city, one, for example, in which buildings are used to break the force of powerful steppe winds and industrial areas are well sited on the outskirts of residential areas to prevent air pollution there.

The authors examine in detail one aspect of environmental problems encountered in building the new city, namely lack of fresh water resources. The area is without rivers, streams or other large bodies of fresh water. After looking at a number of possible solutions, including transporting water across the Caspian and pipelines to distant rivers, planners decided on distillation of ocean water as an answer to the problem. Starting in late 1963, experimental distillation was begun on an industrial basis using crude oil as a fuel. Initially, the distillation unit produced 5,000 cubic meters of fresh water a day; additional capacity allowed this output to increase to 15,000 cubic meters a day. Atomic energy, however, has proven a far more efficient means of producing great quantities of fresh from ocean water.

In late 1972 a BN-350 fast neutron (breeder) reactor with a capacity of 350 megawatts began operating at Shevchenko, the first industrial nuclear reactor in the world. In July 1973 it began producing fresh and industrial water from ocean water as a by-product of energy production. Today 80-82,000 tons of distillate are produced a day or about 440-450 liters per city inhabitant, a level of water supply much higher than in many western cities. Industrial water produced by the reactor is used, among other things, for local irrigation to produce green areas in and around the city. Thus, for the first time, cheap distillation of ocean water using atomic power has become a reality, a great technological achievement and basis for the growth and prosperity of the new city of Shevchenko.

MANGYSHLAK ELECTRICAL POWER SHORTAGE

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 13 January 1982 carries on page 2 a 2,200-word article by S. Bayzhanov, Z. Saqiev and S. Khaydarov, the last of five "Letters From the Mangyshlak Territorial-Production Complex," on development problems. The Mangyshlak Peninsula is a difficult area environmentally but is well located on the border of Europe and Asia and rich in a variety of resources including oil, natural gas, coal, iron, copper, manganese, phosphorite and sulphur. Although czarist scientists suspected the presence of rich minerals in the peninsula, the Soviet regime solved the problem of exploiting the resources there.

After long years of exploration, oil was struck at Zhetibay on 5 July 1961. Margyshlak Peninsula has since become a major production center with tens of millions of tons of oil produced per year by the early 1970's. The 200-millionth ton was produced in August 1981.

The 26th Party Congress placed increased emphasis on coordinating production with yearly output at the fields to reach 18 million tons a year during the current five-year plan. Many problem areas remain, hindering full exploitation of peninsula resources. Use of advanced thermal methods is hindered without a supporting laboratory base. There are problems with well piping. Planning documents for production and survey work are not up to required levels. Plans fail to take important planning areas into account (e.g. industrial water and electricity). Construction work fails to keep pace with development. Oil field reserves as a whole are neglected to overemphasize a particular horizon of production (e.g. oil bearing strata lying near the surface are used as opposed to those lying deeper).

A particularly critical problem is lagging energy supply due to slow facilities construction. As a result, the Mangyshlak Energy Combine will not be able to meet needs in the immediate future. Industries at Zhangaozen were halted 17 times last year due to electrical shortages; the problem exists at Shevchenko City as well. There is plenty of oil and gas, the authors, note; the problem is rather one of an industrial base to process it. The article ends with a plea for exploitation of still unexploited resources, such as abundant supplies of local building stone and mineral rich sledge from water distillation equipment.

9857
CSO: 1832/1086

HELIOTECHNOLOGY EXPLORED

Moscow IZVESTIYA in Russian 15 Feb 82 p 2

[Article by I. Zorich: " The Sun Is Our Guest"]

[Text] There is such a value: solar constant -- the amount of energy received by the earth from the sun.

This is a huge amount: even if we take into account only the solar energy falling on the free untilled surface of earth's dry land, it exceeds by a thousand times the total amount of energy used by man today. By making fuller use of solar energy, even though partially, we would be able to save natural fuel whose extraction is more expensive for more rational use. The USSR State Committee on Science and Technology, the Gosplan and the USSR Academy of Sciences approved a broad program for the development of solar, geothermal and wind power engineering, in whose implementation and participation over 200 scientific research and planning design organizations, enterprises and establishments belonging to 50 ministries and departments is a must. An all-union coordinating center was created -- the Scientific Council on Problems of Utilizing Renewable Energy Sources under the chairmanship of N. Lidorenko, corresponding member of the USSR Academy of Sciences.

What are the long-range prospects of solar power or more broadly -- heliotechnology? Several main directions may be noted here.

A hundred years ago the photoelectric effect was discovered: some substances, when irradiated by light, particularly solar, are capable of producing electricity.

Then silicon monocrystal appeared in the fore. The efficiency coefficient of the best silicon monocrystals attains 22 to 26 percent; and of commercial samples -- 10 to 14 percent. Silicon batteries operate in satellites and space stations and are their sources of power supply. They are still too expensive for mass consumption on the ground because it is extremely difficult to grow large monocrystals of high purity.

At present it is considered most promising to grow silicon ribbons from the melt by Stepanov's method and obtain amorphous silicon. It is now time to take these investigations out of the laboratory experimental stage, develop flow line production technology and create the necessary equipment but, regrettably, the organizations to whom this work was entrusted, are unfolding their activities too slowly.

Several other materials are also suitable for photoelectric converters, especially heterostructures for whose discovery and investigations Academician Zh. Alferov was awarded the Lenin Prize. Theoretically, they can convert up to 93 percent of incident light to electrical energy.

Photoelectric converters may find and have already found broad applications in the national economy, for example, as independent power supplies in lighthouses, radio-relay lines, communications lines and similar facilities which, although using insignificant (100 to 200 watts) amounts of power, are so remote from main lines and communications that supplying them with uninterrupted power is a great problem. Photoelectric converters, however, are capable of operating for many years and need neither fuel nor servicing which is confirmed by the operating experiences of installations scattered from the Barents Sea to the Sayan ranges.

The next direction is the use of solar electric power plants (SES) operating on the thermodynamic principle. A concentrated beam of solar light is directed to a boiler and heats water, converting it to steam which, as in the usual thermal electric power plant, operates a turbine or other power units connected to an electrical generator. So far, there are not over a hundred comparatively low-power SES; however, in the 11th Five-Year Plan period, it is planned to build in Crimea a 3 to 5 megawatt SES and in the future -- 300 megawatt electric power plants. However, small capacity SES should not be overlooked and it is necessary to create inexpensive and efficient typical designs for 1 to 5 kilowatt power plants.

Here, as in any new matter, there are many problems. One is the creation of concentrators "condensing" the stream of solar radiation 1000 times that withstand high temperatures. The Central Design Bureau of Uzbek SSR Academy of Sciences, headed by solar energy enthusiast R. Zakhidov, created various concentrators from glass, metal and polymers and supplies them for experimental installations. But this, of course, cannot satisfy the growing demands of industry. This requires a special enterprise.

The use of solar energy for heating and air conditioning housing and public buildings is very promising. In southern regions, the sun can furnish a third of the power required for heating and two-thirds -- for hot water supplies. For example, the "Sport" hotel in Simferopol provides its guests with plenty of hot water during the summer period. In Odessa, a two-story apartment building is operated in the same way. Single family "solar houses" are available in Dagestan. An experimental complex consisting of three multistory buildings is being built in Ashkhabad. In Uzbekistan, construction is under way of 40 four-story apartment houses and 26 kindergartens for 320 children each. But this is only the beginning. To have a really palpable effect on the country in the form of fuel saved, it is necessary to organize series production of solar receivers.

"Solar houses" not only require technological, but also orifinal architectural solutions and it is very valuable that architects from a number of design institutes of Gosgrazhdanstroy and the Moscow Architectural Institute (MARKhI) have joined in this work actively. Together with the "Kvant" Scientific Production Association, the MARKhI designed a single story "sun house" with a hothouse. This tandem arrangement will make it possible to save 30 to 40 percent of the fuel even in the moderate zone. At the same time, the wide use of solar hothouses would increase by 2 to 3 times the production of fruit, vegetables, rabbits and fowl and eggs in the country as a whole.

Generally, the tie between solar technology and agriculture merits special discussion. Here is what G. Umarov, corresponding member of the Uzbek Academy of Sciences has to say:

"As is well known, our southern republics do not suffer a lack of solar heat and maximum use of the possibilities offered by the sun is necessary. Pulse irradiation of seeds by concentrated sunlight, pasteurization of wines and juices, solar installations for raising water to the surface from underground storage, freshening it and delivering it to pastures, solar dryers, solar houses and much more can be done."

"Thus, comprehensive solar installations used in the summer as water fresheners, and in the winter to heat hothouses, would make it possible to provide the North and Siberia with fresh fruit and vegetables. Here is another example. At present, in Uzbekistan and other regions, fruit and grapes are dried in the open air. Solar dryers would reduce the drying period from 2 - 3 weeks to a week. In this case, almost fully sterile conditions are insured and, therefore, products would be of higher quality and better preserved. The Ministry of the Fruit and Vegetable Industry of Uzbekistan decided to build the first 4 solar dryers with an area of 5000 square meters each in sovkhozes.

The 26th party congress posed the problem: increase the production of raw cotton, particularly of fine-fiber types. If the cotton is sown too early when the soil is not warm enough, the seeds are sickly and perish (in some years, it is necessary to reseed up to 30 percent of the area). If, however, you wait until the soil is well heated, the crop will not have enough time to ripen. Scientists suggested using the so-called microhotbed mode: cover the seeds of the most heat-loving types of cotton which are subject to sickness with a transparent plastic film. The temperature of the earth's surface under it is raised by 8 to 10 degrees and at a depth of 5 to 7 centimeters, where the seeds are buried, it is 2 to 3 degrees higher. The seeds need these 2 to 3 degrees to survive and grow. Moreover, the film protects the soil from being dried out by the heat of spring and from forming a crust in rainy weather. When the seedlings come out of the ground, the film disintegrates. The Okhtinsk (Leningrad) "Plastpolimer" Association produced a film with remarkable characteristics it decomposes by the effect of solar light. It was calculated that the addition costs are low: 2 - 3 kopecks per kilogram of raw cotton (for its cost of 50 kopecks), while the benefits are colossal.

At present, much is being said and written about chlorella. Its nutrient qualities are well known: chlorella paste is a useful additive to the feed of domestic animals, poultry, even silkworms. Moreover, chlorella serves as an excellent fertilizer for cotton. There are many installations in kolkhozes and sovkhozes of Uzbekistan for producing chlorella, but they have low productivity. This is due, primarily, to the inefficient use of solar light necessary to these algae for fixing the atmospheric nitrogen. It is advisable to build agricultural-industrial complexes to grow, reprocess and utilize chlorella. Household sewage water and waste gases from thermal electric power plants can be used to grow chlorella.

Only several directions for the development of solar technology are outlined here. Its possibilities are much wider, diverse and richer, and these possibilities should be converted into reality.

2291
CSO: 1822/112

FUEL FROM TREE BARK

Moscow IZVESTIYA in Russian 11 Feb 82 p 1

[Article by A. Yershov, (Kirov)]

[Text] Yu. Novoselov, Director of the Kirov Scientific Research and Planning Institute of the Lumber Industry, demonstrates a dark and fairly heavy briquet. Made by special technology from ordinary tree bark, it can replace wood in home furnaces or be burned in electric power plant furnaces.

This briquet has a fairly high calorific value -- in a processed form, tree bark is not inferior to lignite. The Kirov Institute workers created a flow line to produce such fuel briquets.

"The essence of the method we suggested consists of removing excess moisture from the raw bark," stated Yuriy Mikhaylovich. "The bark is loaded into a bunker, crushed and passed through a squeezing press. The moisture is removed in a drying machine. The ready mass is then converted easily into briquets."

The special efficiency of the technological flow line suggested by the Kirov people should be noted. In operation, it used its own fuel -- bark; therefore, the power consumption is low. The productivity of the line is 5,400 tons of fuel briquets per year.

Two years ago, a special shop was built at a cost of 123,000 rubles at the Kirov forest base. This small capacity experimental shop paid for itself long ago.

The new line passed government tests and was recommended for industrial production. The first sample line of units and machines that could be obtained were assembled. The usual construction transporters were used and some things were adapted from agricultural equipment. But the question arose: where to manufacture the equipment needed to assemble the new lines? Here is where the complications begin.

The USSR Ministry of Timber, Pulp and Paper, and Wood Processing Industry to which the Kirov Institute belongs, does not have its own machine building plants that can manufacture the necessary equipment. At one time, the Chimkent Automatic Press Plant produced a press needed by the Kirov people, but it was removed from production. The USSR Minstankoprom [Ministry of Machine Tool and Tool Building Industry] proposed instead a press with a capacity four times greater than necessary and costs about 100,000 rubles. Of course, the Kirov people had to refuse. They attempted to turn for help to the related USSR Ministry of Chemical and Petroleum Machine Building [Minkhimmash], but they were refused.

The plant built at Kirov did well in the first few years and produced many briquets for the people. But with time, the equipment wore out and individual units and machines broke down. The flow line was inactive for a long time while awaiting repairs. Where to obtain spare parts? For two years there has been correspondence about the production of five technological flow lines without results.

According to specialists, of the 15.6 million cubic meters of bark that now accumulate in timber industry enterprises, at lumber sawmills and cellulose-paper industry enterprises, only about four million cubic meters are used, primarily for burning in TETs furnaces in a mixture with fuel oil. Huge territories are cluttered up with waste bark and over a ruble per cubic meter is spent to dispose of it. It is better to reprocess huge reserves of this valuable raw material into fuel briquets. Their production will make it possible to reduce the cost of maintaining dumps.

The time has come to put this important reserve in increasing fuel resources into operation. To assimilate the production of fuel briquets it is necessary to have the participation of the Minkhimmash which specializes in the production of crushers and dryers, and of the Minstankoprom which specializes in the production of presses. The USSR Gosplan and the USSR State Committee on Science and Technology are called upon to ask the related ministries to help in this matter.

2291
CSO: 1822/112

SHALE PRODUCTION TARGET

Tallinn SOVETSKAYA ESTONIYA in Russian 17 Jan 82 p 1

[Editorial: "To New Goals"]

[Text] Guided by the decrees of the 26th party congress, the November (1981) Plenum of the Central Committee of the CPSU and the directives of Comrade L. I. Brezhnev, General Secretary of the Central Committee of the CPSU and Chairman of the USSR Presidium of the Supreme Soviet, Estonia miners successfully fulfilled the tasks for 1981 and produced 994,000 tons of shale above the plan.

Inspired by the decrees adopted by the Central Committee of the CPSU and the USSR Council of Ministers on further reequipping mines and developing strip mining, as well as on increasing and improving the wages of miners, and developing widely socialist competition under the slogan "To the 60th Anniversary of the formation of the USSR -- 60 shock labor weeks," workers of the "Estonslanets" Production Association adopted the following socialist obligations for 1982:

On the basis of increasing the efficiency of production and its intensification, the introduction of scientific-technological achievements and advanced experience, to fulfill the annual plan on production volume ahead of schedule by 24 December, and produce 600,000 tons of shale above the plan. Implement state plans for mining shale regularly and provide users fully with high quality technological raw material and power fuel. Increase labor productivity by two percent above the plan, reduce the production cost of a ton of shale as compared to set tasks by two kopecks and obtain 600,000 rubles of profit above the plan. Free 140 people from manual labor and direct them to other production sections.

By improving the organization of labor and production, strengthening the technological and labor discipline increase the load on working and preparatory stopes and tunnel 2000 meters of mine drifts above the set norms. Pass through over half of all drifts by the accelerated method. Some 13 working stope brigades adopted the obligation to produce 500,000 tons of shale each; some 22 tunneling brigades -- assimilate the accelerated tunneling of mining drifts; some 35 excavator brigades and crews of technological motor vehicle transport -- introduce progressive norms. In order to reduce shale losses in the ground considerably, begin, in the "Tammiku" Mine, experimental work on the full extraction of a shale block by using the KSh-3M combine and the hydraulically operated KGP-380 supports. Disseminate the initiative of stope brigades of the "Estoniya" Mine, led by Allan-Feliks Peet, Yaak

Pruunes and Mikhail Balychenko, on fulfilling the tasks of the 11th Five-Year Plan period by the 50th Anniversary of the Stakhanov Movement -- 31 August 1985.

Support the initiative "More shale at the least cost," save annually 1.5 million kilowatt-hours of electric power, some 3000 gigacalories of heat and 200 tons of boiler furnace fuel. Obtain 1.37 million rubles from the implementation of proposals by innovators and inventors.

Continue the work on the realization of the outlined program of social development of the collective, on the improvement of production and everyday living conditions of workers, and the acceleration of the construction rate of a middle trade school to prepare cadres for the shale basin.

In order to attract local reserves more fully to implement the food supply program, build a swine breeding farm for 1140 head and 1000 square meters of hothouses, and increase the production of auxiliary farms by 10 percent. Association workers obligated themselves to increase assistance to agricultural farmers -- by helping kolkhozes and sovkhozes during sowing and harvesting for not less than 6500 man-days, help repair agricultural equipment and reclaim 430 hectares destroyed by mining.

"Estonslanets" Association workers assure the Central Committee of the CPSU and Comrade L.I. Brezhnev that they will apply all their efforts, experience and knowledge toward fulfilling ahead of schedule the planned tasks for 1982, and the five-year plan as a whole, and will honor the jubilee year by shock labor and new successes in the fight to implement the directives of the 26th party congress.

The socialist obligations were discussed and adopted at meetings of labor collectives of the Labor Red Banner order "Estonslanets" Production Association.

2291
CSO: 1822/112

FUELS

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PIPELINE TRANSPORT OF LIQUEFIED NATURAL GAS RECOMMENDED

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 12, Dec 81 pp 22-23

[Article by A. Ye. Polozov, northern branch of the VNIIST, Ukhta: "Main Pipelines for Transporting Liquefied Natural Gas"]

[Text] High rates of growth of gas extraction in the country are generally being held back by the limited throughput of the gas-transport systems. Increase in the range of gas transfer with the existing technology for its pumping results in a decrease in the economic efficiency of the main gas pipelines. A search for a new and more efficient method of gas transport is therefore required.

In addition to increasing the output, it is necessary to reduce the effect of positive temperature of the pumped product on the natural conditions of the northern regions, and to stipulate a reduction in labor outlays in constructing and operating the pipelines.

It is possible to increase gas supply with an unchanged section of the gas pipeline by pumping the gas at negative temperatures.

Different variants for transporting gas in a gaseous state at -2, -30, -70°C, and in a liquid state -120°C have been examined.

Transporting gas at -2 and -30°C does not require changing the technology of its pumping or design of the pipeline. However, in order to increase the gas pipeline output respectively 1.5- and 1.6-fold, it is necessary to increase the pressure to 10 MPa. At negative temperatures, this may result in an increase in emergency situations with a rise in cumulative destruction.

Pipelines for pumping gas at temperature of -70°C and -120°C make it possible to increase the output of the pipeline system at 10 MPa pressure respectively 1.9- and 3.6-fold.

Similar pipelines are more complicated engineering structures than the standard gas pipelines, however. In addition to a thick thermal and hydraulic insulation, compensators of linear movements which are reliable in operation must be used, as well as reinforced ballasting, special devices (fixed supports) for fastening the pipeline in an axial direction on the junctions and turns of the route, and in individual cases, even between the compensators.

A tendency towards rise in cumulative destruction as a result of a decrease in plastic properties of the metal is noted in a pipeline with temperature of the transported gas -70°C which has rigid operating characteristics.

The pipeline for transporting liquefied natural gas (LNG), in addition to guaranteeing higher output, permits a 2.5-fold reduction in pressure. When there are possible accidents in this pipeline, one should not expect cumulative destruction, since in this case a practically incompressible liquid is being transported in which the velocity of sound (pressure waves) is significantly higher than the velocity of spread of the crack in the brittle metal.

A lower negative temperature for a pipeline made of specially developed economically alloyed steel with correctly selected compensator and pressure on the order of 4.0 MPa does not have a significant negative effect on its strength.

The transition to constructing pipelines for transporting LNG makes it possible to reduce the demand for labor resources, diminish the metal consumption by more than two-fold, permits transporting of oil, casing-head gases, as well as many materials in the solid, liquid and gaseous state in addition to the natural gas when these materials are in microcapsules or pulverized.

The design of a pipeline for transporting LNG and its interaction with the environment have been studied the least.

The average drop between the temperature of construction and the temperature of operation of pipelines is 140-150°C. Depending on the geometry of the pipeline and coefficient of linear expansion of the metal, this results in a decrease in its length on the average of 1.2 m for each kilometer of the route. Under these conditions, it is possible to guarantee safe operation only with correct distribution of the preliminary stresses of the body of the pipeline before the product is sent through it, and removal of these stresses after a change in temperature of the pipeline, or when compensators of temperature deformation are used.

The widespread P-type compensators are not very applicable for LNL pipelines, since the length of the pipeline in this case is increased by 10% because of the compensators (with diameter 1420 mm). There is roughly the same increase in consumption of metal and thermal-water-insulating materials. In addition, there is a rise in activity to extinguish the thermal influxes and hydraulic resistance in the pipeline. It becomes necessary to construct compensation niches which increase the cost of building 1 km of pipeline with diameter 1420 mm by R 25,000. Axial compensators are the most applicable for these pipelines. However, the lens compensators currently employed in industry are rated for low pressure. The compensators which are popular on high pressure gas pipelines on territories to be prepared cannot be used since one of their elements is a rubber packing which is not stable at temperatures below -100°C.

The modern branch of the VNIIST [All-Union Scientific Research Institute for Construction of Main Pipelines] has developed a design of a gasket self-packing compensator for low-temperature pipelines. Self-packing in it is achieved because of gage pressure of the evaporating gas in a special cavity which is removed beyond the limits of the pipeline.

Because the compensator model uses a packing gland made of polytetrafouoroethylene, satisfactory results are obtained at a pressure to 5.5 MPa and temperatures of -196°C.

In order to prevent excessive deformation in the body of the pipe and thermal installation coating on the sections before the junction and turns in the route, as well as in a mountainous locality and on rectilinear sections, installation of fixed supports is provided between the compensators. The operation of these supports is based on the use of plastic diaphragms which rest on the ground. The pipeline is fastened in a fixed support in an axial direction with the help of a wedge element which has slits for better attachment.

The thermal insulation on the pipelines for LNG transport gives it additional buoyancy which required its additional fastening when the pipe is laid on swamps and flooded sections. Special anchors have been developed for shallow and deep swamps which use the cold of the transported product.

Liquefied natural gas is characterized by low evaporation heat. Even with a small influx of heat, its intensive evaporation occurs. Therefore an invariable condition for reliable pumping of gas on pipelines is the presence of a high-quality thermal insulation. In selecting the thermal insulation material, in addition to thermo-physical properties (heat conductivity, heat capacity) it is necessary to take into consideration mechanical indicators. Mechanical strength of the material for compression must be no less than 0.4 MPa. Special designs of thermal insulating coatings have been created in which strong thermal insulating materials are used in addition to weak-carriers.

In order to reduce the amount of friction between the pipes which are moving because of the temperature effect, and the insulation, it is necessary to use lubricants, for example, graphite of brand GS-4. When it is used, the required friction coefficient of 0.20-0.25 can be attained.

It is expedient to use foam polyurethane, foam polystyrene of brand PS-BS (self-extinguishing), superfine fibers based on basalt, mineral cotton, foam glass and others which are distinguished by a low coefficient of heat conductivity as the thermal insulating material. Foam concrete as well as backfill, perlite, ver iculite and finely dispersed silica can be used as the strong material. The use of multiple layer thermal insulation will drastically increase the operating efficiency of the pipeline system, and increase the distance between the intermediate cooling stations.

In designing and building low-temperature pipelines one should focus primary attention on guaranteeing reliable waterproofing. Waterproofing must at the same time be an anticorrosion protection. Steam waterproofing is the most important and the most complicated element in the pipeline for transporting LNG. Depending on the conditions of laying, it is expedient to use different steam waterproofing materials. On complicated junctions and swamps, one should use vacuum insulation with periodic restoration of the vacuum once every 3-5 years.

On dry, low-moisture and wet sections the waterproofing can be made of metal welded sleeves, plastic welded sheets or rolled materials. When the pipeline is laid underground, it is expedient to use as the waterproofing not only high frost resistant materials of the fluoroplast type, polyethylene or polyisobutylene, but also polyvinyl chloride plastic, polypropylene and others. The thermoplasts must be reinforced with fiberglass to increase strength.

Studies of sheet polymer material (plasticized PVKh, colored and colorless) that were conducted under laboratory conditions indicated the amount of steam permeability equal to 2.17 g/m^2 in 24 h. This does not exceed the permissible values. Even higher results were obtained under full-scale conditions with waterproofing made of a polyethylene sleeve fabricated by the extrusion method.

When a multiple-component product is pumped through the pipeline at negative temperatures by standard pumps, it is necessary to have high precision and purity of the working surfaces. The phenomena of deterioration in the work of the lubricant and packing elements can be observed. A new pump has therefore been designed which does not require high precision of the working surfaces, or the use of lubrication and packing assemblies.

Special pipe steels and welding wire have been especially developed in recent years for construction of pipelines transporting LNG.

In order to verify the theoretical developments to create main low-temperature pipelines under full-scale conditions, an experimental pipeline section and storage tank are being constructed at the test site of the northern branch of the VNIIST.

In order to obtain a perceptible effect from introducing main LNG pipeline it is necessary to increase the activity of research aimed at developing the most economical type of transporting natural gas.

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ARMENIAN SSR GAS CONSUMPTION ANALYZED

Yerevan PROMYSHLENNOST' ARMENII in Russian No 12, Dec 81 pp 48-50

[Article by E. S. Kotanyan, economist, and N. S. Nesunts, engineer, Yerevan scientific subdivision of the VNIIEGazprom: "Analysis of Gas Consumption in the Armenian SSR"]

[Text] One of the important tasks of reliable natural gass supply to the national economic sectors is correct planning of the operation of the gas-transport system. Its unstable operating mode is explained by seasonal nonuniformity of gas consumption.

It consequently becomes necessary to study the regimes of gas use with subsequent analysis of the findings. Correct evaluation of the actual gas consumption indicators by the main categories of consumers makes it possible to select the most efficient methods for reducing seasonal nonuniformity, and determining the necessary volumes of regulated reserve capacities.

The Armenian SSR is territorially represented by five major industrial centers: Yerevan, Kirovakan, Sevano-Razdan, Leninakan, and Dilizhan. The specific weight of gas consumption of the industrial centers in 1980 was: Yerevan 62 percent, Kirovakan 13.7, Sevano-Razdan 13.8, Leninakan 7.3, and Dilizhan 3.2 percent. The Yerevan industrial center where major heat-intensive enterprises of the republic are centered, the Kirovakan and Sevano-Razdan industrial centers (enterprises of the chemical and power engineering industry) consume the main percentage. Less fuel-intensive enterprises of the light, food, machine construction sectors of industry are located in the Leninakan and Dilizhan industrial centers.

The analysis we made on the dynamics of actual gas consumption by industrial and communal-general sectors of the industrial centers demonstrated that the indicators of gas consumption in the 10th Five-Year Plan as compared to the Ninth Five-Year Plan noticeably diminished, especially for the industrial sector. The rates of gas consumption for years of the five-year plan are presented in the table, where the first years of the five-year plans (1971 and 1976) are taken as the base of the calculations (equal to one).

The indicators of actual gas consumption during the years of observation (t=15 years) made it possible to determine the basic component in the process of gas consumption, the trend of its growth.

Промузел, потребители 1	Годы 2									
	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
3 Армянская ССР										
4 промышленность	1.0	1,11	1.22	1.28	1.36	1.0	1.03	1.01	0,94	0.99
5 коммунально-бытовой сектор	1.0	1.21	1.38	1.47	1.60	1.0	1.02	1.09	1.03	1.24
6 Ереванский										
4 промышленность	1.0	1.06	1.12	1.16	1.21	1.0	1.06	1.06	1.02	1.07
5 коммунально-бытовой сектор	1.0	1.23	1.38	1.40	1.57	1.0	0.93	1.00	0.91	1.09
7 Кироваканский										
4 промышленность	1.0	1.12	1.23	1.36	1.48	1.0	0.94	0.93	0.83	0.87
5 коммунально-бытовой сектор	1.0	1.13	1.36	1.60	1.37	1.0	1.01	1.14	1.13	1.20
8 Севано-Разданский										
4 промышленность	1.0	1.49	1.96	2.13	2.36	1.0	0.98	0.85	0.70	0.77
5 коммунально-бытовой сектор	1.0	1.39	1.51	2.32	1.96	1.0	1.56	1.46	1.69	2.42
9 Ленинаканский										
4 промышленность	1.0	1.09	1.26	1.22	1.27	1.0	1.07	1.08	0.87	0.89
5 коммунально-бытовой сектор	1.0	1.10	1.35	1.35	1.47	1.0	1.18	1.30	1.16	1.44
10 Дилижанский										
4 промышленность	1.0	1.18	1.29	1.89	1.84	1.0	1.05	1.07	1.15	1.31
5 коммунально-бытовой сектор	1.0	1.13	1.36	1.15	1.93	1.0	1.27	1.38	1.37	1.55

Key:

1.	industrial center, consumers	6.	Yerevan
2.	years	7.	Kirovakan
3.	Armenian SSR	8.	Sevano-Razdan
4.	industry	9.	Leninakan
5.	communal-general sector	10.	Dilizhan

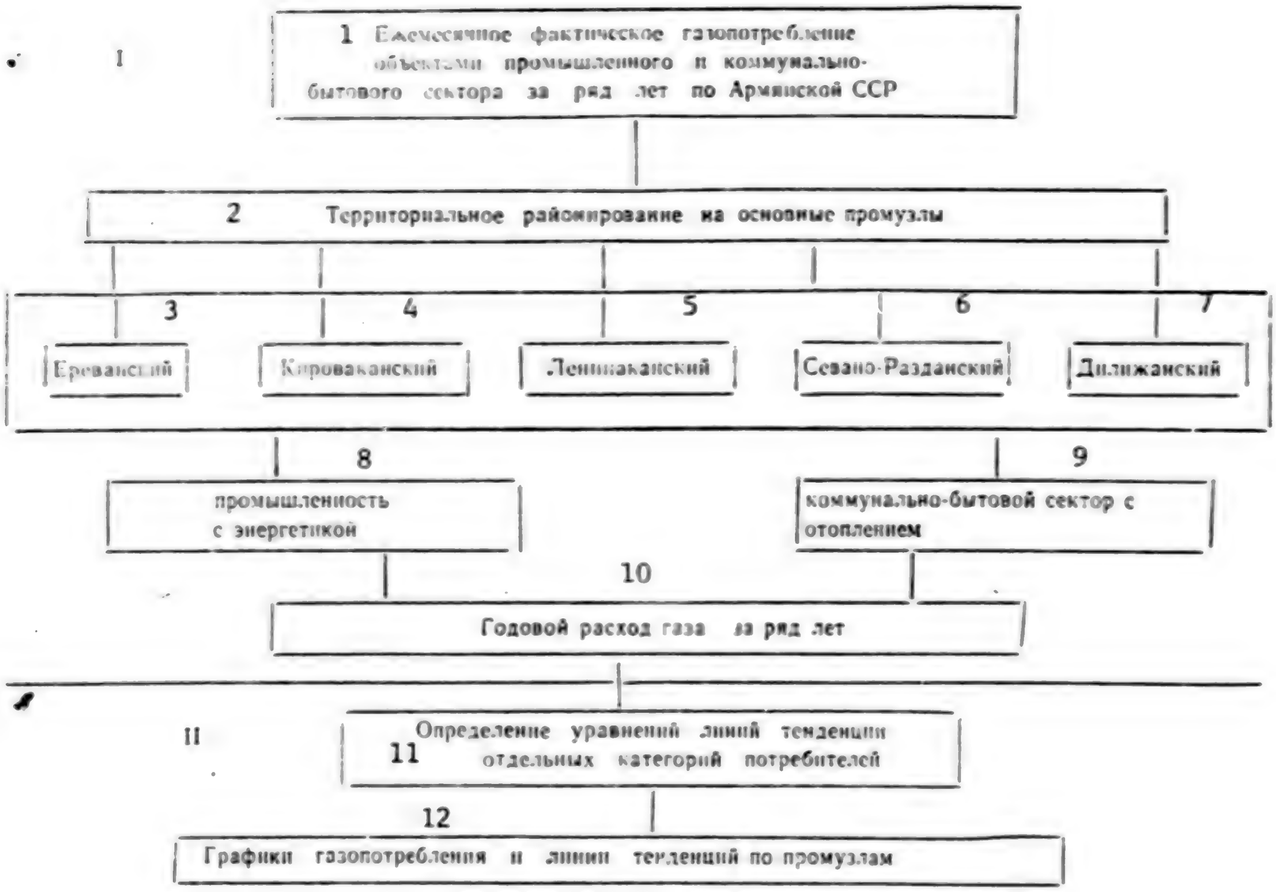
The initial stage of work is the collection, processing, grouping of initial information on the actual monthly gas consumption by the facilities during a number of years. (Engineers G. M. Pakhchanyan and Z. A. Sarkisyan participated in processing the materials). Then a territorial zoning of the industrial centers was done with a breakdown by industrial sectors and into communal-general consumption with further determination of the gas consumption growth trend (see the plan). The main part of the work was collecting and preparing the information file of data which served as the basis for an analysis of the trends of development and the rates of growth of gas consumption for the examined industrial centers in the republic.

The development trend is analytically presented by a straight line in the form of a random time formula:

$$Y = f(t),$$

$$Y = a + b\,t,$$

where a--ordinate of the point of intersection of the straight line with Y;
b--angular coefficient of the straight line;
t--independent time variable.


I
1 Ежемесячное фактическое газопотребление объектами промышленного и коммунально-бытового сектора за ряд лет по Армянской ССР
2 Территориальное районирование на основные промузлы
3 Ереванский
4 Кироваканский
5 Ленинаканский
6 Севано-Разданский
7 Дилижанский
8 промышленность с энергетикой
9 коммунально-бытовой сектор с отоплением
10 Годовой расход газа за ряд лет
II
11 Определение уравнений линий тенденции отдельных категорий потребителей
12 Графики газопотребления и линий тенденций по промузлам

Plan for Calculating Growth Trends in Gas Consumption of Armenian SSR Industrial Centers

Key:

I. preparation of information file of data
II. determination of growth trends
1. monthly actual gas consumption by facilities of industrial and communal-general sector for a number of years by the Armenian SSR
2. territorial zoning for main industrial centers
3. Yerevan
4. Kirovakan
5. Leninakan
6. Sevano-Razdan
7. Dilizhan
8. industry with power engineering
9. communal-general sector with heating
10. annual consumption of gas for a number of years
11. determination of equation for trend lines of individual categories of consumers
12. graphs of gas consumption and trend lines for industrial centers

The a and b values are defined as follows:

$$a = \frac{\Sigma t^2_i \Sigma X_i - \Sigma t_i X_i \Sigma t_i}{\Sigma t^2_i n - \Sigma t_i \Sigma t_i}.$$

$$b = \frac{\Sigma t_i X_i n - \Sigma t_i \Sigma X_i}{\Sigma t^2_i n - \Sigma t_i \Sigma t_i}.$$

where t_i--ordinal number of year;
n --number of year;
x_i--gas consumption.

These data were used for all the industrial centers to construct lines for the development trend of gas consumption that were computed by the method of most squares. The figure presents a graphic illustration of the trend lines for the republic as a whole, as well as for the Kirovakan, Leninakan and Yerevan industrial centers.

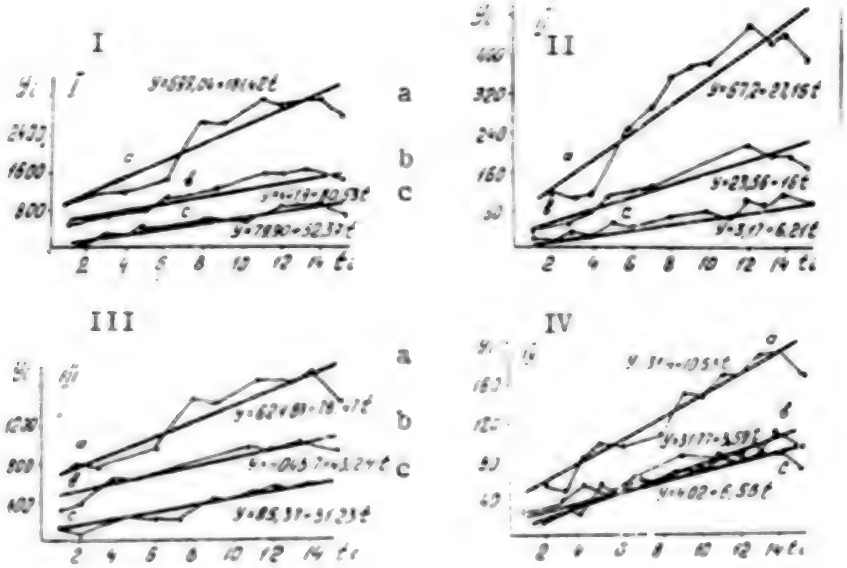


Figure.
Key:

I. Armenian SSR
II. Kirovakan industrial center
III. Yerevan industrial center

a. for all consumers
b. industry
c. communal general services

The conducted studies on actual gas consumption by basic categories of consumers of the republic industrial centers will make it possible to use analysis results to forecast and to plan both the gas consumption and fuel consumption. In addition, results of analyzing the existing situation in republic gas supplv must be taken into consideration in formulating measures for further planning and substantiation of the optimal volumes of reserve fuel (mazut), determination of the volumes of underground gas reservoirs. Resolution of these questions is of significance for the Armenian SSR which does not have its own fuel resources and uses high-calorie imported fuel, natural gas and mazut.

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FUELS

GASOLINE PRODUCED FROM COAL

Moscow IZVESTIYA in Russian 22 Jan 81 p 6

[Article by A. Blokhnin "Car Fueled by Coal"]

> [Text] Of course, this assertion does not at all mean that the tank of our "Zhiguli" is filled with crushed coal at the filling station. As you have evidently guessed, we are concerned with gasoline made out of coal.

There are several glass flasks on the wooden support. In the extreme flask there is a dark brown almost black liquid. This is resin obtained during reprocessing of coal powder. Next to it are products of distillation of "coal oil": boiler fuel (mazut), and a quite transparent substance with a smell well known to all, gasoline. Gasoline from coal!

I became acquainted with this unusual set in Moscow, in the State Scientific Research Power Engineering Institute imeni G. M. Krzhizhanovskiy. In order to see precursors of such an unusual set, we have to set out to the city of Kalinin where the first experimental-industrial unit for high-speed method of coal pyrolysis is operating.

A unit of impressive dimensions, as high as a five-story house, is located in the annex to the first municipal power plant built on the shore of the Volga in former Tver' back in 1929. The unit reprocesses 4 tons of coal ground into a powder per hour, issues resin, semicoke (or as it is called coke fines) and fuel gas which immediately enters the furnace of the steam boiler.

"Mendeleyev once said: If you burn oil you might as well stoke the furnace with currency," notes the head of the thematic association of the laboratory "Energotekhnologiya," corresponding member of the USSR Academy of Sciences Z. Chukhanov. "This is very correct in relation to coal as well. Our experimental unit is adjusting the technology for processing coals of the largest and most promising field, Kansko-Achinsk. By the way, for the experiments in Kalinin, the coal is shipped from the Irsha-Borodinskiy open pit in the Krasnoyarskiy Kray. The findings raise optimism: the average output of resin is 16 percent. But this is far from the limit. As a result of reprocessing, a significant quantity of phenols is obtained. This is the basic raw material for organic synthesis and production of plastics. There are also many substances which are the raw material for dyes, solvents and other valuable types of chemical products."

The so-called coke fines, as indicated by experiments on industrial scales, are excellent metallurgical fuel. In many cases, they can successfully replace activated coal, fulfill the role of a filler in rubber items, replacing technical-grade carbon. Finally, coal fines can be used to purify different contaminants, including sea water purification from oil.

But we will return to the "coal oil." Artificial liquid fuel from it is not inferior in quality to standard mazut and gasoline. The gasoline sample that I became acquainted with has an octane number of 92. It is true that distillation of coal oil requires special technology. It is impossible to set it up at standard oil refineries. Large energy industrial complexes will therefore appear with time. Their product will be a high grade fuel and electricity.

It is common knowledge that a fuel and energy complex (KATEK) of unprecedented scale is being created at the giant coal pits of the Kansko-Achinsk basin in the Krasnoyarskiy Kray. The first two large GRES's are being built here according to the standard plan, and the Berezovskiy GRES-3 will not become a simple large thermal power plant, but a powerful energy production kombinat where 500,000-800,000 T of coal will be processed every hour. It will essentially be the first major enterprise of the new sector, energy technology.

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CSO: 1822/106

BUNGLING, LACK OF GASOLINE HAMPER RURAL GAS DELIVERIES IN GEORGIA

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 15 December 1981 page 2 carries V. Tsirekidze's 700-word piece on problems of bottled gas deliveries to remote, mountainous Oni Rayon. There was no problem until this past year, and most households in the rayon switched from wood to gas heating and appliances. The trouble came about after the State Gasification Committee closed down [konservatsiya] the local gas bottling center in neighboring Ambrolauri because it posed a hazard to the airport there. Since then the gas has had to be trucked 300 km from Kutaisi over bad roads that are often closed in the winter. But the Kutaisi distribution center has been plagued by acute shortages of gasoline, lubricants, and spare parts, so that its truck fleet has been idled for days at a time all year. The reporter urges the Gasification Committee and also local party and soviet organs to get involved.

GEORGIAN GAS SUPPLY CHAIRMAN EXPLAINS SHORTCOMINGS

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 2 December page 2 carries a 1,300-word item based on information gathered by KOMUNISTI's Industry and Transport Department Chief O. Arobelidze, concerning the fact that villages in several West Georgian rayons have not been getting regular bottled gas deliveries for some months. Schedules were disrupted, and delivery drivers sold what gas they could get wherever and to whomever it suited them, at high prices. After a special meeting of the board of the GSSR State Gasification Committee, many rayon-level and local gas supply officials were fired or reprimanded. Gasification Committee Chairman B.T. Lobzhanidze issued a statement focusing on three main causes of the problem: 1) sporadic and disrupted deliveries of bottled gas from outside the republic; 2) problems in operations at the Batumi Oil Refinery (no details); 3) the fact that there are about 30,000 unregistered gas appliances in the republic--often operated under unsafe conditions by the citizens who own them--resulting in an underestimation of the amounts of gas that the republic will need in any time period. In a brief concluding commentary, the editors quote Shevardnadze's reference to the gas supply problem at the 4th GCP CC Plenum, and warn both the Gasification Committee and all other vital consumer service organizations that mismanagement and inflexible response to the people's needs will not be tolerated.

In a related 1,000-word article, KOMUNISTI correspondent G. Kalanadze asks Tbilisi Heating Operations Chief Teimuraz Gurgenidze to respond to complaints from numerous districts in the city about inadequate heating. He devotes considerable space to an enumeration of the meticulous and extensive winter preparations that were made in Tbilisi, with close supervision from government and party units, starting way last spring, including new heating equipment and system components, replacement of old installations, consolidation of small and inefficient units, and so on. Some units have yet to go into operation. Problems include the fact that the gas network cannot supply even distribution to all districts, also various breakdowns in the heating and gas supply networks and other systems impinging on them, delayed repairs, and so on.

GEORGIAN INDUSTRIAL, MINE SAFETY CHAIRMAN EVALUATES SAFETY RECORD

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 8 December page 1 carries a 1,000-word Gruzinform interview with G. Lortkipanidze, chairman of the State Committee for Supervision of Safe Working Practices in Industry and for Mine Supervision, on problems and prospects in his jurisdiction, which includes a diversity of sectors such as elevator and cableway safety and gas equipment. Although the accident rate has been declining steadily, it is still too high in some sectors. He focuses at some length on serious safety violations and shortcomings in the coal industry that finally led to crackdowns in recent times, the dismissal of many key executives, and so on (Gruzugol' General Director Gvindzhilia and Tkibuli Lenin Mine Chief Pataridze are mentioned). The interview then deals with another aspect of the committee's jurisdiction, rehabilitation [rekul'tivatsiya] of worked lands. Overall, the record is good except for the Tkibuli mining district and Kvaisa (Ossetia).

TKIBULI COAL MINE'S LAG DUE TO SHORTSIGHTEDNESS, MISMANAGEMENT

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 6 December page 2 carries a 1,400-word article by Sh. Amashukeli and V. Tsirekidze about the chronic troubles of the Tkibuli coal field's West Mine, which consistently fails to fulfill plans and meet targets in a number of indicators, including prime cost. When the unit's Mine No 1 began to play out some 20 years ago, work on No 2 was supposed to commence. But the project was allowed to drag, and then a combination of extremely complex geological conditions and hasty organization led to inadequate and improper layout of the new mine, further complicated by a lack of experience and the necessary machinery. A highly promising open-pit operation has been similarly plagued. Underground rail lines and above-ground facilities are inadequate; repairs and maintenance have been badly managed. In addition, working and living conditions have been deplorable--workers wait years for adequate housing, and so on--and turnover is high. Wages and incentives need to be straightened out.

PROBLEMS PERSIST AT TKIBULI COAL MINE

[Editorial Report] Tbilisi KOMUNISTI in Georgian on 8 December page 2 carries a 1,300-word article by V. Tsirekidze concerning a number of persistent problems at Tkibuli's Lenin Coal Mine that were discussed at the mine's trade union meeting. These include labor discipline, especially in the transportation sectors; quality of the product (excessive moisture and ash content, too much barren rock mixed in) for which large fines have been paid; lagging repairs and maintenance largely owing to the management's practice of keeping operations going on weekends and thereby leaving no time for such work; and food services, housing, and other amenities.

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CSO: 1813/715

UDC 622.33(47+57).004.18

EFFICIENT USE OF RESOURCES IN COAL INDUSTRY EXAMINED

Moscow UGOL' in Russian No 12, Dec 81 pp 14-17

[Article: "Efficient Use of Fuel-Energy and Other Material Resources in the Coal Industry"]

> [Text] Supply reserves for the service of society, this is the most important economic-political task at the current stage.
>
> From a decree of the CPSU Central Committee and the USSR Council of Ministers "On Strengthening Work for Economy and Efficient Use of Raw Material, Fuel-Energy and Other Material Resources."

The CPSU Central Committee and the USSR Council of Ministers in the adopted decree "On Strengthening Work for Economy and Efficient Use of Raw Material, Fuel-Energy and Other Material Resources" have outlined measures for the economic use of raw materials, materials, fuel and energy in all links of the national economy.

As noted in the decree, the 26th CPSU Congress has defined that the most important trends for a steady rise in the national economy are acceleration of its transition to primarily intensive development, efficient use of the created production potential, all possible conservation of material, labor and financial resources. In order to fulfill the program of economic and social development of the country planned by the party in the 11th Five-Year Plan, it is necessary to involve enormous raw material and fuel-energy resources into production. However, extraction of raw material and fuel is costing more, and the reserves of minerals are not inexhaustible. Under these conditions, the task of the most economical and efficient use of them acquires especial national economic importance.

The coal industry has positive experience of conserving material and fuel-energy resources. For example, the enterprises of the association "Karagandaugol'" without increasing the volumes of consumption of materials and fuel during the period from 1970 to 1977 increased coal extraction by almost 10 million T.

Because the mines in the branch have used mechanized timbering, the consumption of lumber for reinforcing the faces has been reduced from 16.4 million m^3 in 1965 to 8.4 million m^3 in 1980, with an increase in coal extraction by 17 million T.

After broadly expanding socialist competition under the motto "a fund of conservation in each collective, and a personal account for each worker," the country's coal workers are achieving an efficient and economical use of raw material, material and fuel-energy resources. The leading collectives of the mine imeni SOTSIALISTICHESKIY DONBASS of the association "Donetskugol'," imeni V. I. Lenin of the association "Voroshilovgradugol'," imeni 50th Anniversary of October of the association "Gukovugol'" and others have been the initiators of this competition.

All-union public inspections of the efficient use of raw material, materials and fuel-energy resources have been conducted in the sector. Over 6,000 miners annually participate in them. In 1976-1980, the workers, engineering-technical workers and clerical employees of the enterprises and organizations of the coal industry made about 5,000 suggestions to improve the use of mining equipment, perfect the production processes, and conserve resources. The workers of the country's coal industry during the 10th Five-Year Plan conserved 160,000 T of rolled metal products, 241,000 T of cement, 817,000 T of boiler-furnace fuel, 18.480 million GJ of heat, over 3 billion kW-h of electricity, and guaranteed a decrease in consumption of a number of other materials. The collectives of the mine imeni Kostenko and imeni 60th Anniversary of the October Revolution of the association "Karagandaugol'" and "Rodinskaya" of the association "Krasnoarmeyskugol'" were awarded the challenge Red Banners of the AUCCTU, Komsomol Central Committee and USSR Gossnab for advances made during the inspection. In addition, 71 collectives of the sector were awarded diplomas of the AUCCTU, Komsomol Central Committeeand the USSR Gossnab.

At the same time, as noted in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Strengthening Work for Conservation and Efficient Use of Raw Material, Fuel-Energy and Other Material Resources," in addition to the available positive experience, the proper turning point has not yet occurred in improving the use of material resources. Resource-conserving technological processes are not being introduced everywhere. The extraction of minerals does not always guarantee their complete removal from the depths. Production wastes are insufficiently recovered. Considerable losses of metal, fuel, lumber, cement and other products are permitted during use and storage.

These shortcomings are also present in the coal industry. In the last 3 years, the volume of coal extraction has diminished by 1.1 percent, while the consumption of materials and fuel in this case increased by 8 percent. This was a consequence of the deterioration in the condition of the mining equipment, especially with underground method of extraction, as well as the permitted lagging in the production of mechanized complexes, stoping and tunneling combines, excavators, drilling machines, bulldozers with large unit output and other most important types of equipment and machines of the new and higher technical level. In addition, many enterprises and associations still have significant shortcomings in standardizing the consumption of material resources.

They focus little attention on the efficient use and storage of metal, lumber, cement, petroleum products, and the reuse of spent materials and items. The production associations for coal extraction during the 10th Five-Year Plan guaranteed a decrease in the standards of consumption of supports in the mines only by 17 percent versus 19 percent for the annual plans. There was also an underfulfillment of the assignments set for the five-year plan for conservation of rolled metal products and cement in capital construction, the standards of consumption of rolled metal products were reduced by 0.6 percent versus 4 percent for the annual plans and cement by 1.3 percent versus 5 percent for the assignment.

All of this indicates that not all the reserves of conservation and increase in output of products are being used with the resources available in the sector. It is the most important task of the workers of the coal industry to place these reserves at the service of society.

However, certain leaders of the all-union and industrial associations, and individual enterprises have still insufficiently expanded work to eliminate nonproductive consumption and unjustified losses. Lagging in conservation of rolled products of ferrous metals was noted in 1981 at the plants of the "Soyuzuglemash," construction materials in the kombinats of "Soyuzshakhtostroy," supports at the mines of the Ukrainian SSR Ministry of the Coal Industry, the associations "Sredazugol'," "Tulaugol'" and "Chelyabinskugol'."

Guided by the indicated decree of the CPSU Central Committee and the USSR Council of Ministers, it is necessary to drastically strengthen work for conserving all types of fuel-energy and material resources at all levels of sector control.

The geography and mining-geological conditions of coal extraction have noticeably changed in recent years. The regions of Siberia, North and Far East are acquiring greater importance for supplying the national economy of the country with fuel. However, in this case there are increased expenditures for extraction, construction of enterprises and transporting of products. Conservation of each ruble and each kilogram of coal, metal and other materials, and their efficient use therefore have great national economic importance.

The adopted decree provides the economic leaders with great potentialities for effective material and moral stimulation of the enterprise collectives in order to guarantee a more economical and efficient use of all types of material resources.

Starting in 1983, the five-year and annual plans in industry, construction and transportation will affirm assignments for the net cost of products (work), and within these assignments, the limit (maximum level) of material outlays in a monetary expression for a ruble of product (work). One of the most important criteria in developing and evaluating the fulfillment of counterplans will be the indicators which characterize the decrease in material outlays and conservation of resources in coal extraction, as well as the volume of additional production of products because of conserved materials and electricity. In order to increase the degree of interest of the workers and engineering-technical workers in the efficient use of material resources, a relationship will be set up between the size of the funds of economic stimulation and the level of material outlays per ruble of product (work). Bonuses to the workers and engineering-technical workers for conservation of specific types of material resources will be expanded. Bonuses to the management and clerical workers of the production associations, enterprises and organizations will be introduced depending on the decrease in the level of material outlays as compared to the approved limit. The primary task of economic services in the sector is the most efficient use of these economic levers locally. It is necessary to guarantee: improvement in production aimed at all possible decrease in energy and material consumption of production; maximum extraction of coal from the depths; significant decrease in wastes and losses of raw materials at all stages of their processing, storage and transporting; primary allocation of capital investments, equipment and facilities of construction organizations to implement measures of conservation of material resources.

The basic directions for economic and social development of the USSR for 1981-1985 and the period to 1990 stipulate advanced rates of development of coal extraction by the most effective open method based on broad introduction of advanced technology and mining-transport equipment of high unit output. Preliminary calculations demonstrate that by increasing the specific weight of coal extraction by the open method only by 1 percent, one can increase the annual conservation from decreasing the net cost of extraction of R 50 million, significantly reduce the consumption of lumber for timbering, metal and other materials.

Work is constantly underway in the mines and open pits of the sector aimed at more complete and efficient extraction of coal from the depths. The total losses of coal during the 10th Five-Year Plan were diminished by 0.6 percent, and the operating losses by 1.4 percent. This is not the limit. The losses of coal in the depths in the 11th Five-Year Plan must be diminished by 0.8 percent. For this purpose it is necessary to bring the volumes of nonblock extraction of coal to 55 percent, introduce progressive technological plans for stoping and preparatory work in the main basins which guarantee the minimum level of losses, expand the area of application of modern mechanized complexes on the thick beds, as well as on beds with complicated mining-geological conditions, and increase the volumes of resuming use of reserves on developed territories and natural objects.

The workers of coal enrichment have done considerable work to create and introduce new technological processes which make it possible to reduce losses of coal and improve the quality of the manufactured concentrate. As a result, the level of losses in 1980 did not exceed the standard. However, there are still enrichment plants in the sector where planned losses are above the established. It is necessary to eliminate losses of coal with enrichment wastes, to extensively update the production processes, and in the 11th Five-Year Plan bring the specific weight of highly efficient methods of enrichment to 92.3 percent and reduce the standard losses of coal by 0.1 percent, or 300,000 T.

It is an important task of the coal industry enterprises to reduce consumption of electricity. There are many examples in the sector of a prudent attitude towards its use. For example, the "Raspadskaya" mine is continually diminishing the specific consumption of electricity per 1 T of extracted coal. Over two-fold less electricity is currently consumed and the average for the enterprises of the USSR Ministry of the Coal Industry, and 12.2 million kW-h of electricity above the plan were conserved during the 10th Five-Year Plan. It is necessary to make a detailed study of the experience of these collectives and introduce it so that conservation of electricity becomes the standard for each mine, open pit, factory and plant.

The CPSU Central Committee and the USSR Council of Ministers in its decree indicated the need to increase the role of science in solving the tasks of efficient use of all types of material resources. It is necessary for the successful fulfillment of this instruction to stipulate an increase in the volume of research to create resource-conserving equipment and technology of extraction and coal processing in the annual and five-year plan for scientific research work; to increase the exactingness towards the engineers, designers, planners and production engineers for development and introduction of new equipment, progressive technological processes which guarantee the efficient use and conservation of resources; to strengthen the appropriate subdivisions in the institutes engaged in developing technology and standard support of the sector. The coal industry currently has significant scientific and technical potential and is capable of guaranteeing the solution of the set task. However, this potential is not always used with maximum output. Material and energy capacity of many new machines are increasing faster than their output. The specific weight of use of outdated technology is still significant. This results in an increased consumption of material and energy resources. The insufficient efficiency of work of individual institutes is the reason that the program for transition of development of thick steep beds in the mines of the Prokop'yevsko-Kiselevskiy Rayon of the Kuzbass to comprehensive mechanization with filling of the worked space has not been fulfilled. Consequently, the consumption of timbering in this region is 3-4-fold higher than on the average for the sector, and in the preserved blocks under the surface facilities, over 1 billion T of coal have been preserved, while the mines systematically reduce the volumes of extraction because of a shortage of prepared reserves.

The necessary measures are not being taken to introduce modern technology for making and protecting mining shafts, organized preparation of the means for removing and adjusting the metal arched timbering. This results in inefficient use of the allocated resources of rolled metal products and deterioration in the condition of the mining shafts.

The use of high-strength, thermally reinforced metals, plastics and other materials can become one of the sources of conservation of material resources in the coal industry. This will permit a simultaneous decrease in the weight of the equipment, and improvement in the quality and reliability of the mining equipment.

Definite experience of using effective types of materials and designs has been accumulated in mining construction, such as prestressed reinforced concrete components, lightweight metal designs for buildings, plastic pipes, etc. Their extensive introduction is the more important because this will permit not only a decrease in the consumption of metal, cement and other materials, but also reduction in labor intensity and the periods for fulfilling construction-installation work, especially at surface facilities. However, not all the construction and planning organizations are focusing the proper attention on this question. As a result, construction of surface structures, especially on reconstructed mines, is lagging.

One of the significant reserves for fuel conservation in the coal industry is the use of methane which is obtained during degasification of coal beds. This reserve, however, is practically not utilized at the enterprises of the Kuznetsk and Karaganda coal basins, and at the mines of the Ukrainian SSR Ministry of the Coal Industry, the number of boilers using methane diminished during the 10th Five-Year Plan.

The efficient use of raw material, fuel-energy and other resources significantly depends on the quality of the planned solutions in the construction and updating of enterprises. The planning organizations have begun to focus more attention on questions of conserving resources. Thus, the transition to bulk extraction of the beds in the open pits of the association"Ekibastuzugol'" will increase the quantity of extracted reserves, and consequently, the volume of coal extraction. At the same time, the efficiency of the planning solution, especially for the underground method of extraction is still not sufficiently high. It is necessary for the all-union association "Soyuzshakhtoproyekt" to take efficient measures to improve the quality of planned development.

Improvement in the efficient use of available resources, improvement in the system of standards, timely pinpointing of the active and establishment of new progressive standards of consumption for raw material, materials, fuel-energy resources with regard for introduction of the achievements of science and technology, as well as the experience of the leading collectives have great importance.

Work in the coal industry to create a system of standards for planning has been underway since the beginning of the 1970's, and encompasses all the main sectors included in the USSR Ministry of the Coal Industry. Basic method materials were developed and approved in the 10th Five-Year Plan for the creation and improvement in the system of sector standards. Main and leading scientific research institutes have been defined and special subdivisions have been set up in them which have already accumulated positive experience of working in this sector. Instructions have been made, approved and brought to the associations and enterprises for standardizing a number of the most important types of materials and items. Thirty-five groups of consumption standards for different materials for repair and operation of the main funds and standards of demand for 36 most important types of equipment have been developed. Work is being completed on standards of reserves of 42 names of materials and items for associations of coal extraction and machine construction plants,and seven names for enterprises of capital construction.

One should note, however, that the creation of a scientifically substantiated system of norms and standards as the basis for planning the demand for resources has not been completed in the sector. Individual norms are insufficiently progressive, related to the actually developed level of material consumption, do not take into consideration the possibility of improving production processes based on the introduction of new equipment. At the same time, the potential created in this area in recent years is the basis for solving the task of increasing the substantiation of the approved norms, timely bringing to the associations and enterprises standards of consumption of the most important types of materials, fuel and energy in a natural expression in the five-year and annual plans, guarantee of strict control over the observance of the standards, and organization of periodic renewal of the active norms for consumption of material resources with regard for the periods set in the plan of introduction of new equipment and technology.

Improvement in product quality, strengthening of work for conservation and efficient use of raw material, fuel-energy and other material resources are impossible without standard-technical and metrological support. The basis for this is standards and specifications. The task is to continually and systematically conduct further development of standard-technical documents, improve the standards and specifications by including in them progressive norms and indicators aimed at primarily guaranteeing efficient and economic use of resources.

It is necessary to introduce indicators of specific material and energy consumption into the standards and specifications for the basic products of the coal industry (stoping and tunneling combines, mine scraper conveyers, loading machines, etc.).

The all-union association "Soyuzuglemash" and"Soyuzugleavtomatika" should take the proper measures for strict accounting and standardizing of consumption of fuel, energy, raw material and materials in creating new equipment, as well as equipping the mines, open pits and enrichment plants with advanced measurement equipment for computing the volumes of shipped fuel and the consumption of energy resources.

The CPSU Central Committee and the USSR Council of Ministers for broad involvement of the workers in strengthening conservation and the economy, acknowledged in their decree the expediency of conducting in the 11th Five-Year Plan in the national economic sectors, the associations, enterprises and organizations an all-union public inspection of efficient use of raw material, materials and fuel-energy resources with an annual summarization of the results. The coal industry workers must actively participate in this examination, achieve during it an efficient use of all types of resources, and at the same time make their contributions to fulfilling the decisions of the 26th CPSU Congress and the assignments of the 11th Five-Year Plan, for realizing the program for further improvement in the welfare of the Soviet people adopted by the party.

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CSO: 1822/106

FUELS

NEW COAL RESERVES DEVELOPED WITH OPEN PITS IN KARAGANDA

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 28 January 1982 carries on page 2 a 2,100-word article by E. Ebikenov and O. Aymaghanbetov on new coal reserves being developed with open pit methods at Borili in the Karaganda basin. The article is published under the regular rubric "Let Us Carry Out the Decisions of the 26th Party Congress."

The Suyqbulaq River Valley near Pavlodar in Karagandinskaya Oblast has been known as Borili. It is a stretch of hills, steppe, thorny reeds and caragana bushes near the river. Rich coal fields were discovered there in 1936 but World War II prevented immediate exploitation. It was only in late 1979 that first efforts were made to mine Borili coal.

Production began on 14 April 1980. Some 2,046,000 tons were produced during that year; more than 4 million in 1981. Plans call for an annual production of 10 million tons in the future. Coal produced at Borili is delivered to Qushoqy for transshipment.

Ebikenov and Aymaghambetov stress the efficiency of open pit mining employed at Borili, the rapid pace of mine development and the emergence of a large mining complex. The pits themselves are 300 by 70 by 200 meters deep with the upper coal horizon located 25-26 meters below the surface.

Problems in opening the mines included inefficient ore-carrier use, organizational inadequacies and all-pervading dust. In spite of initial difficulties, production is ahead of planning and gathering momentum. Primary costs are below the average for Karaganda coal production as a whole.

Plans for the future include a rail line from the pits to the railhead at Qushoqy to be completed in 1982 and a mining settlement for mine workers. Some long-term problems are a shortage of miners trained in open pit methods since the schools concentrate on traditional, underground mining technology; local environmental damage due to accumulations of mine refuge and failure to backfill pits; coal deliveries to Qushoqy that lag substantially behind production and shortages of surface, coal-moving equipment and rolling stock. Proven reserves at Borili are 600 million tons.

NEW TECHNOLOGY WIDELY USED IN BOZASHY OIL PRODUCTION

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 7 January 1982 carries on page 2 a 1,900-word article by S. Bayshanov, Z. Saqiev and S. Khaydarov, the third in a series of five "Letters From the Mangyshlak Territorial-Production Complex," on the Qalamqas and Qarazhambas oil fields of the Bozashy Peninsula. The article describes the bare, sparsely vegetated Caspian coast where major oil fields are now being developed and discusses two major fields, at Qalamqas and Qarazhambas, in particular.

The Qalamqas field has been in production for about 3 years; it produced 73,000 tons of oil during 1979, the first year of its existence, 1.26 million tons in 1980 and 2,245,000 tons in 1981. Work there is done on alternating work and rest shifts of 10-15 days each. Some 2,000 workers now work at the field, with numbers expected to rise to 10,000 by year's end and 20,000 by 1990. In all 161 wells have been drilled; 98 are producing at present.

At Qarazhambas, production has reached 150 tons a day. A 2-3 fold increase is planned for the near future. At both fields considerable advanced technology is used. At Qalamqas, drilling rigs are on rails to facilitate moving them from one site to the other. Reagents are pumped into well heads to liquify the oil and separate water. At Qarazhambas electric current is used for the same purpose.

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CSO: 1832/1094

MAJOR BROWN COAL DEPOSITS IN TURGAYSKAYA OBLAST

Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 5 Sep 81 p 2

[Article by Zh. Zhunisov: "Brown Coal of Torghay"]

[Text] The total reserves and composition of the Orlov brown coal deposits discovered by the Torghay Geological Survey Expedition have been determined. The Kusmuryn and Eginsay deposits in the coal basin were the basis of comparison. Orlov coal reserves are considerably cheaper. This is because some coal layers are more than a hundred meters thick, and coal can be produced with open pit methods. Most production processes will be mechanized. Deposits are more than 500 meters deep and 5-6 kilometers long. The problem of refinement of the production process will be solved through use of rotor excavators and conveyors in production.

Practical experience has shown that the brown coal will be a good fuel for energy production. It will be used in other industrial sectors as well. There are abundant possibilities for obtaining supplementary industrial products such as coke, liquid fuel and gas by processing the brown coal alone.

A great city will rise near "Zapadnyy" Sovkhoz in the near future. Miners and specialized cadres will live in it. In addition two powerful electrical energy stations will be constructed between Derzhavin City and the mines.

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LAGS AND ADVANCES IN COAL PRODUCTION NOTED

Moscow PRAVDA in Russian 19 Feb 82 p 1

[Editorial: "Important Tasks of the Miners"]

[Text] The leading mining collectives have started the second year of the 11th Five-Year Plan well. Responding with action to the decrees of the CPSU Central Committee and the USSR Council of Ministers for accelerated technical re-equipping of the mines, increased extraction of coal by the open pit method, and increase in the tariff rates and salaries of the miners, they have noticeably raised the rates and rhythm of work.

A number of mines and open pits in the country have daily extracted considerably more coal in January than in December. The miners of the Donetsk mines imeni SOTSIALISTICHESKIY DONBASS and imeni Zasyad'ko , the collective of the Kuzbass mine "Nagornaya," open pits "Nazarovskiy" in the Krasnoyarskiy Kray and imeni 50th Anniversary of October in Kuzbass have made a good start. This is what is important: the addition to extraction here was mainly through better organization of labor and more efficient use of equipment. It is now necessary to strengthen and multiply the success of the leading workers, and make it the property of the entire sector.

Guarantee of stable operation of the fuel and energy complex is a national task, the most important section of the party and economic work. In his report at the 26th CPSU Congress, Comrade L. I. Brezhnev noted that the development of heavy industry, especially the fuel and energy sectors, is an unconditional prerequisite for solving all of the national economic tasks.

It should be noted that the coal industry has not fulfilled the state plan for 4 years in a row. In January, 22% of the mines and open pits did not cope with the plan again. This means that it is not only necessary to overcome the lag, but also significantly increase the extraction in each face. For this we need more complete utilization of the equipment and all possible improvement in labor productivity. It is very important to propagandize more broadly the leading experience which has been accumulated in the collectives headed by two-time Hero of Socialist Labor I. Strel'chenko, Heroes of Socialist Labor M. Chikh, A. Kolesnikov, Yu. Bronnikov and other innovators of production. In accordance with the decisions of the 26th CPSU Congress and the five-year plan assignments, the miners are faced with extracting 24 million T of coal more this year than last. The increase in this case must be guaranteed as a result of the better use of equipment and the development of the "leading worker" movement.

The miners have always acted as the leading team of the working class, famous for labor traditions and patriotic initiatives. The Stakhanovite movement that was born in the coal industry encompassed millions of Soviet people in its time and was a powerful lever for economic progress and a school for educating the masses. The current generation of miners is worthily continuing and multiplying these traditions. Today it can and must raise even higher the banner of socialist competition for an increase in the extraction of coal in each face, for the unconditional fulfillment of the state plan.

Acceleration of coal extraction by economically efficient open pit methods is a special concern of the sector. Almost 40 percent of the total coal extraction will be extracted by the open pit method this year. "Bogatyr" in Ekibastuz alone will produce 51 million T, which is 5 million T more than last year. It is necessary to perform a billion m^3 of stripping work on the whole for the sector for the successful fulfillment of the plan of open pit extraction. New equipment with high unit output will be additionally introduced at the open pits. It is the duty of the party organizations and all the communists to lead the struggle for its better use, reduction in the idling of equipment, and attraction of the miners by personal example.

The USSR Ministry of the Coal Industry should increase its attention to reconstruction of the active enterprises, the most rapid start-up and assimilation of new facilities. There are still many shortcomings here. In the last five-year plan, the ministry did not assimilate over 730 million rubles for production construction, did not introduce facilities for over 5 million T of fuel, and did not put into operation over a million square meters of housing. It is impossible to tolerate this situation.

A lot remains to be done in order to improve the organization of labor at the mines, increase its productivity, strengthen the labor and technological discipline. The shortage of coal is still great because of an excessive accident rate, standstills of the combines. The level of mechanization of the auxiliary work is low. All of this must become the subject of serious examination in the party and trade union organizations.

The USSR Ministry of the Coal Industry and other interested ministries and departments are faced this year with implementing a system of measures to guarantee fulfillment of the decrees of the CPSU Central Committee and the USSR Council of Ministers for technical re-equipping of the mines and increasing the extraction of coal by the open pit method. It is necessary to improve the organizational and economic work in the headquarters of the sector, in its scientific and production subdivisions, and to achieve accelerated technical progress.

The miners of the sector are faced with extracting 721 million T of coal and 35 million T of shale, increasing labor productivity and improving other indicators. There is no doubt that the plans are intensive. But they should and can be fulfilled. The leading extraction and tunneling brigades show an example here. In honor of the 60th anniveraary of formation of the USSR they have adopted high socialist commitments: to fulfill ahead of schedule the plan for the second year of the five-year plan and call all the workers of the sector to take up a shock-worker watch. It is now important to evolve this movement and provide fertile soil for it.

The ministries and departments are obliged to support the efforts of the miners for raising coal extraction by providing the sector with equipment, materials and other resources and by building housing and other facilities. The Ministry of Communications must ensure a smooth supply of cars for loading the extracted fuel, deliver it to the consumers faster, and primarily, to the thermal power plants and central heating and power plant.

The struggle for more coal in the second year of the 11th Five-Year Plan is going at full speed. It is the duty of the party and trade union organizations, and economic leaders to do everything so that it is still effective. Let the coal stream that is coming to the surface become fuller with each day and gather strength!

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CSO: 1822/107

'ROVEN'KIANTRATSIT' EXPLAINS LABOR PRODUCTIVITY

Kiev RABOCHAYA GAZETA in Russian 29 Dec 81 p 1

[Article by A. Tkhor, brigade foreman of workers of the stoping face of the mine imeni M. V. Frunze of the production association "Roven'kiantratsit": "To Whom Much Has Been Given"]

[Excerpts] In order for the section to yield a thousand tons of coal per day, 160 people must be working in it, and we have 121. There are 86 miners working directly in the longwall instead of the 113 stipulated by the plan. You think that the plan has been reduced for us? Not at all. Conditions are simply being created for people for highly productive labor.

The section collective not only extracts coal, but also prepares a new longwall for itself, thus making a foundation for smooth work in the future. Concern for the future is a special concern. No matter how well the longwall works, sooner or later it will be exhausted and extraction will have to be reduced. If people are not confident that a new front of work will be waiting for them by that time, they will voluntarily or involuntarily slack off. Why should they hurry?

According to the rules, the preparation of new longwalls is managing the tunnelers from the mining-preparatory sections, but it has become standard practice for them to wait with tunneling the mining shaft. The collective of our section which is managed by the most experienced commander of production Ivan Ivanovich Bereznichenko, with the support of the party, trade union and Komsomol organizations of the section has decided to take this into their own hands.

It would appear that if it were known who should extract coal and who should make the mining shafts, there would be nothing to philosophize about here. Each does his own work, but we are not concerned with placing responsibility on each other for extracting more coal. Our wages depend not on that ton of coal which lies in the bed, but on the ton which is extracted. This is why we have come to master the related profession of tunneler.

The links are involved in turn with tunneling mining shafts. In tunneling the section, the workers are striving to load all the coal on the conveyer, and this means 2,200 T of first-class anthracite. When the work front is prepared by "foreign" tunnelers, the fate of these tons varies.

After taking upon ourselves additional loads, we started to search for ways to reduce the labor intensity of the work. We decided to lengthen the longwall to 300 meters, double the standard. We thus won time since it is now unnecessary to make an additional shaft, and we won in coal since it is selected more purely from the longwall.

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DOLZHANSKAYA-KAPITAL'NAYA MINE OPENS

Kiev RABOCHAYA GAZETA in Russian 26 Dec 81 p 1

[Article by L. Mokrov: "Star on the Headframe: 'Dolzhanskaya-Kapital'naya' Mine Open!"

> [Text] It is a great holiday for the miners of Voroshilovgradshchina: the state commission has signed an act for start-up of the mine "Dolzhanskaya-Kapital'naya" of the production association "Sverdlovantratsit."

This is the republic's largest mine. It is rated for extraction of 10,000 T of coal per day. The mine was proclaimed an all-union shock-worker Komsomol construction site. The entire country built it. Twenty-six trusts and 52 construction, installation and mine-tunneling adminstrations contributed to the construction of the coal giant. Equipment and materials were supplied by 327 enterprises in the country. A enormous amount of work was done, three vertical shafts of depth 685 meters each and dozens of undergound mine shafts were made. The mine was built in the complex of the central enrichment plant with output of 6.8 million T of anthracite per year.

The builders worked especially selflessly this year. They assimilated R 44 million, including 24.2 million for construction-installation work. Up to 5,000 people were working at the construction site on the hottest days. Their work was guided by the party, trade union and Komsomol headquarters. Four permanent and 11 temporary party groups were set up at the construction site. Their work was coordinated by the party organization secretary.

The new enterprise has been equipped with highly productive equipment. New conditions have been created here for fruitful work of the miners. Coal from the stoping faces goes to the skip shaft by powerful belt conveyers, and people and materials are sent from the surface to the work sites with the help of self-propelled cars, low-ground and monorail tracks.

Two cafeterias with pavilions, cafe, station for hot food for the underground crew, food and dry goods stores are already operating at the mine's industrial area.

The general contractor, the trust "Sverdlovskshakhtostroy" and numerous subcontracting organizations have focused a lot of attention, in addition to building the mine, on building facilities of social, cultural-general purpose. A total of R 18 million was spent on this. A whole microregion of multistory houses for the miners and their families has grown up in Sverdlovsk. A nine-story dormitory, school, and dispensary-sanatorium have been built.

"Dolzhansksya-Kapital'naya" is very important for the entire production association "Sverdlovantratsit." Here is why. The mines "Mayak" and "Odesskaya" which are located nearby have exhausted their reserves in the coal fields assigned to them. The miners have to go deeper. This impairs the work of the miners and complicates the working conditions. Closing of these enterprises would result in a drastic decrease in coal extraction in the association. "Dolzhanskaya-Kapital'naya arrived just in time. The collectives of both mines will switch completely to the new mine where they will work under considerably better conditions.

In the last days before the start-up of the mine, the installers by tradition put a star on the highest point of the complex, the mine headframe. It shines 109 meters towards the sky. It is turned on when the mine fulfills the plan. Now it has been lit because of the holiday.

"The mine star," says N. V. Tikhonov whose brigade produced the first tons of anthracite back on the eve of the 64th anniversary of the Great October, "shines for us now like an advance. But we will try to fulfill the plan from the very first days of operation of the giant mine, and will master its rated output faster."

A triumphant meeting because of the start-up of the mine complex and the central enrichment plant was held yesterday. The complex is working for the five-year plan.

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CSO: 1822/107

MISMANAGEMENT, INEFFICIENCY REPORTEDLY DELAY MINE CONSTRUCTION

Kiev PRAVDA UKRAINY in Russian 24 Oct 81 p 2

[Article by A. Zharkikh, correspondent of PRAVDA UKRAINY: "How They Cut Out the Mine"]

> [Text] "I would love to talk to you but I am in a hurry, I am going to Sverdlovsk to 'Dolzhanskaya-Kapital'naya.' The chief engineer of the institute 'Yuzhgiproshakht' V. A. Maksimovich is visiting there. I have to decide certain questions with him for the further construction of the first phase of our mine," said the director of "Sukhodol'skaya-Vostochnaya" E. M. Uglov on the run.
>
> I have to admit that I was surprised: "Sukhodol'skaya-Vostochnaya" has already been operating for over 8 months, and discussions are still being held about "construction of the first phase."
>
> "You see, there are still no mines like this. Only one level is operating, or rather, two thin longwalls with total daily load of about 300 T," clarified Eduard Mineyevich. "Although they plan significantly more for us."

The first phase of this new coal enterprise (five mechanized faces) with output of 1.2 million T of coking coal should have been started up at the end of last year. The planning organizations were confident of this, and therefore they developed the appropriate production program and the schedule for mastering the rated output. Now all the calculations, as they say, remain unsettled.

Why did it happen that the mine was put into operation in a truncated form? There are many reasons. The term "long-construction" can be applied to "Sukhodol'skaya-Vostochnaya." It has been under construction for over 15 years. For all of these years the collectives of the administrations included in the kombinat "Voroshilovgradshakhtostroy" drilled shafts, erected surface structures and prepared certain mining shafts. The work went so-so, and no one knew the exact schedule for start-up of the enterprise.

But then a schedule was defined, 1980. The leaders of the kombinat together with the Ministry of the Coal Industry of the Republic had to scrupulously compute the potentialities, plan the volumes of construction-installation and tunneling operations, and distribute the forces. They did nothing like this. Moreover, 2 years before the outlined schedule for the end of construction of the first phase of "Sukhodol'skaya-Vostochnaya," all the tunnelers were taken from the facility and transferred to "Dolzhanskaya-Kapital'naya."

Work was again in full swing here only in the start-up period. Dozens of collectives, thousands of builders, installers and tunnelers were included. They labored with a high output. Almost as much was done in the first year as in the first 10 years.

But they could not make up for lost time. The error with distributing the work force was the main reason that a significant part of the mining shafts were not successfully made. The level of 915 meters (three longwalls) dropped out of the start-up complex. A compromise solution was adopted: put into operation (as an exception) the first stage of the first phase of the enterprise. An act of the state commission for start-up of "Sukhodol'skaya-Vostochnaya" was signed with this formulation.

A schedule for completion of construction of the ore yard and the remaining three faces with corresponding mine shaft at a 915 meter level was appended to the act so that the situation did not look so bad. It was signed by the head of "Voroshilovgradshakhtostroy" V. T. Khvorostyanoy. It was planned to include all of this subcomplex for the work of this year. But alas! Eight months passed and there could still be no talk of starting up the new longwalls. It is impossible to start up what does not exist!

Nature often acts against the will of people, especially when people have a scornful attitude of its "whims." Apparently, this is precisely how the specialists acted who studied the mining-geological conditions of the new mine construction. The fact is that the coal bed here was considered dormant for a long time. This was taken into consideration in developing a draft for construction of the enterprise. Its capriciousness was only defined when the bed was cut. It proved to be dangerous for gas discharges.

The colleagues of "Yuzhgiproshakhta" had to make significant changes in their calculations. There was a long chain of discrepancies. Many questions were not solved until now. For example, the draft stipulated that the rock would not be brought to the surface, but stored in the worked longwall. They plan to use a special "Titan" complex for this purpose. Then it was found that it was impossible to use the machine, and the institute has not yet found a new solution. Now the coal and rock are fed onto one conveyer line: the workers of the stoping face and the tunnelers often "take a smoke" for a long time waiting for their turn.

Errors were allowed by the designers in selecting the coal-extracting equipment. According to their calculations, the "1K-13" were to operate on the thin bed. It goes without saying that the machines are suitable for these mining-geological conditions. But the sad fact is that the coal machine construction only manufactured five of these units. It was decided to install grading units "Ust-2M" type in the faces of "Sukhodol'skaya-Vostochnaya" (by the way, in the neighboring mine administration imeni Oleg Kosheviy this equipment is successfully operating under similar conditions. At the section of I. Ye. Sliva in the mine administration imeni Lyutikov up to 800 T of coal per day are extracted using it. So you do not have to go far for experience).

"Nevertheless we had to disassemble the graders," the director of the mine E. M. Uglov said distressfully. "Our coal is very strong, and a so-called sticky coal hangs on the roofing. The 'IK-101' combines that we are thinking of introducing are also not very suitable. We have to cut the rock but there is no other solution."

Here we should mention that many other specialists of mining with whom we spoke do not share the viewpoint of the director of "Sukhodol'skaya-Vostochnaya." It appears in this respect that the association "Krasnodonugol'" will help the leaders of the new mine to find the optimal solution.

They did not suspect in "Yuzhgiproshakhta" of course that their miscalculation in selecting the type of extracting equipment would create such a problem. By the way, the designers can object to what we have suggested based on the local mining-geological conditions, and it is not our fault that the machine builders cannot supply the necessary combines. But in developing technical documents it is impossible not to consider the real potentialities. In the same way, it is impossible to ignore the opinion of the operators.

Until now there has been no definitive solution for the technology of working off the longwalls at the 915 meter level. The plan stipulates for extraction of coal by direct method.

"We consider it more expedient to use the shaft system," says the general director of the association "Krasnodonugol'" V. N. Kravtsov. "It will be easier to control the roofing, and this means, there will be fewer interruptions in fuel extraction. Moreover, we are successfully using this method in the mine administration imeni Lyutikov and at other enterprises.

Debates are currently underway and all possible discrepancies are being eliminated. No one is seriously engaged in building the 915 meter level. The total volume of work stipulated by the schedule has only been fulfilled by one-third. The collective of tunnelers of Krasnodonskiy ShPU-2-420 are mainly working here. It would seem that there were sufficient forces to force preparation of the mine shafts. But this does not happen.

In August, for example, 7 brigades only traversed 96 meters. Each brigade including no less than 40 people advanced an average of 10 meters in the month. With these rates the mine will take another 15 years to build. The fault not only lies with the actual tunnelers. The collectives of A. Makartsov, M. Korosev and V. Zagorskiy that are famous in Voroshilovgradshchina are working here. But they have such conditions that they can hardly move. On the one hand they are restrained by the regime of concussive explosion (stipulated for the discharge-dangerous mines), and on the other hand by the transport chain: preference is naturally given to extraction of coal and not rock.

It is difficult to develop a high rate of preparing mine shafts in the situation of the active enterprise, when all the forces are concentrated close to the shaft. It is difficult, but possible with skilful organization of labor, well-thought out coordination of the actions of all the extracting and tunneling brigades. This requires a unified control center capable of altering the situation when the operators live with one concern, and the mine builders others. The whole work suffers from this.

According to the schedule for mastering the rated output, "Sukhodol'skaya-Vostochnaya" must produce 560,000 T of coal this year. It will not produce over 80,000 T.

"You do not scatter this coal on the road," says the general director of the association "Krasnodonugol'" V. N. Kravtsov.

In fact it is better to have little than nothing at all. We will ask a question which sets everyones teeth on edge: is it worth it to put into operation such a, to put it mildly, inferior first phase of the mine? The work has been done. Now another aspect is important, how to accelerate the start-up of the 915 meter level under the present conditions? The attention of the specialists from the kombinat "Voroshilovgradshakhtostroy" and the association "Krasnodonugol'" should be concentrated on this, despite the fact that construction of "Dolzhanskaya-Kapital'naya" which has entered the final stage requires great efforts.

As noted above, few forces of mine builders remain at "Sukhodol'skaya-Vostochnaya". They need to be sent to the right channel and the output increased.

The kombinat leaders have unfortunately forgotten their promise to eliminate the omissions indicated in the act and complete preparation of the remaining three longwalls during the year. The association "Krasnodonugol'" is mainly concerned with how to correct the plan of coal extraction in the corresponding organizations. They have already estimated there that the mine will produce no more than a 120,000 T of fuel next year. They add in this case "if two new longwalls are started up at the level 750 meters, and one at the level 915 meters." The association leaders have already become accustomed to the thought that the lower level will not be put into operation even this year.

With this approach to the important state work, the situation at "Sukhodol'skaya-Vostochnaya" will not change of course.

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CSO: 1822/106

FUELS

LIGHT-WEIGHT STRUCTURES REDUCE MINE CONSTRUCTION TIME

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Jan 82 p 1

[Article by I. Aryasov: "Light-weight Mine"]

> [Text] The mine builders of the Tul'skaya Oblast are completing start-up preparation of the "Berezovsksya" mine with output of 1.5 million T of coal per year. Light-weight structural parts have been used for the first time on broad scales in mine construction. Hundreds of tons of metal have been conserved. The period for construction of the coal enterprise has been cut in half. Labor productivity for installation operations has increased 2.5-fold.

The following characteristic exists in Mosbass: when cars with bags of straw are on the surface of the mine at the shaft, this means that there is a problem underground.

It occurred in the face of Oleg Andereyev at depth of 110 meters from the freezing well drilled several years ago.

"More pump, fellows!" cried the brigade foreman. A pump was supplied and they continued to work calmly, not suspecting that 80,000 m^3 of water with sand would gush through this open well into the mine.

The quicksand increased. It is a common phenomenon in Mosbass. The tunnelers did not retreat. They put several more pumps every 50 meters. But the water kept coming.

Straw was then brought into play. Imagine a tunnel slightly smaller than in the metro, and water in it up to your chest and higher. Filtering crosspieces made of wooden cross ties which are filled with straw were placed on the full section of the shaft. The straw lets the water pass but holds back the sand.

One crosspiece, a second and a third. Tunnelers from neighboring faces came to the aid of Andreyev's brigade. Ten crosspieces were installed at the same time. The water washed out the ground from under foot. Holes were plugged up with whatever they had, and padded jackets were used as stuffing.

I recall how one of the tunnelers who came up after two shifts of fighting the element suddenly remembered:

"Hey guys, I left the keys to my house in my padded jacket!"

"Never mind, crawl in through the window."

"I live on the third floor."

"These are only details," his comrades smiled, hurrying to the showers.

Days passed. The water did not abate. Divers were called to "Berezovskaya" in order to determine where it was gushing from.

Four fellows in light rubber suits with heavy gas tanks on their shoulders received respectful-envious glances from the tunnelers. The divers only reached half of the flooded gallery: everything further, to the very roof was filled with sand.

A meeting of coal miners was taking place at that time in Moscow. The head of the kombinat "Mosbassshakhtostroy" Viktor Grigor'yevich Radchenko ran to the telephone at every break and called the mine: how was the quicksand? He came to "Berezovskaya" from Moscow late at night and did not leave the construction site for several days, organizing elimination of the break.

E. Polak, the deputy minister of the USSR coal industry who makes a once-a-year visit, made an urgent trip to the mine. At a brief working meeting, they decided to call in specialists from the city of Antratsit in the Voroshilovgradskaya Oblast. The general director of the production association "Spetstamponazhgeologiya," Doctor of technical sciences E. Kipko was on the phone to "Berezovskaya" at 22:00.

Within 20 hours, the powerful "KrAZy" had arrived from Antratsit at "Berezovskaya."

The influx of water was halted, and then completely stopped. The brigades of Yuriy Nasonov, Viktor Gordun and Yuriy Khomenko installed concrete crosspieces at that time. They installed them under the same conditions as when the water was almost up to the chest. They cut off the water and saved the mine. Cutting of the extraction galleries had not been halted for a minute in the meantime. It is true that the rate of tunneling dropped from 40 to 15 m per day, but Vyzcheslav Ivanov, Iosif Yunevich, Nikolay Zavrazhnov and Viktor Timoshenko persistently led their brigades forward.

Ten days later nothing in the mine under construction indicated what had happened. The daily tunneling soon rose to almost 60 m and the intramine transport was operating like electronic clocks. The concrete crosspieces were opened up and the galleries were cleaned of the sand.

Five years ago, not far from ancient Venev, the tunnelers of vertical shafts drove in the first pegs at the site of the future mine. Its intensive construction began a mere 2 years ago. By the 64th anniversary of the Great October, the technological chain of surface facilities was being test run.

The brigades of Vladimir Sautkin and Pavel Fil'chenkov, Ivan Terekhov and Lev Savel'yev, installers Ivan Krivul' and Yuriy Chatkin, tunnelers of Aleksey Gololobov and Eduard Vinogradov distinguished themselves at the high-speed construction. The secret of the high-speed construction of "Berezovskaya" is simple: almost half of the buildings and surface structures here were made of light-weight structural parts for the first time in our country's mining construction. They replaced the traditional brick and reinforced concrete. The mine has become lighter by tens of thousands of tons of metal, cement and sand. Labor productivity of the workers was increased from 2- to 5-fold in its construction. For example, the team of installers assembled a building with area of a thousand m^2 in only 3 weeks. It would have taken 50 people almost a year to build the same building out of brick and reinforced concrete.

"We consider 'Berezovskaya' to be yesterday," says the head of "Mosbassshakhtostroy" V. Radchenko. "At our next mine construction, 'Bel'tsevskaya' all the surface structures will be made of light-weight structural parts. We are manufacturing them at our plants. The next stage is the block-set method of building the surface coal enterprises."

The coal basin near Moscow provided the country with 45 million T of fuel in 1945. During the 1950's, the development of the basin was halted. Extraction dropped in half. In the current five-year plan, 17 mines with total output of 5 million T of coal are being worked in the Moscow region. It is the task of the young collective of the kombinat "Mosbassshakhtostroy" to make up for this lagging. Its number has increased in a short time from 2,500 to 8.000 people. Two powerful mines "Bel'kovskaya" and "Vladimirskaya" were recently opened at the same time. The mine "Podmoskovnaya" that was built in 1974 reached rated output of 2.3 million T of coal. In a word, the near-Moscow mine builders have added 7 million T of fuel to the basin in only several years.

New mines are ahead of them. Their coal will go to the power plants in the center of Russia.

Now task number one is "Berezovskaya." From a distance it looks like an enormous bird which has lowered its light silvery wings before take-off in order to bounce sharply upwards. Hundreds of tunnelers and installers are working round-the-clock here.

Coal will be extracted from the first longwall in March.

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CSO: 1822/107

OVERPRODUCTION CAUSES EARLY DEPLETION OF MINE

Kiev RABOCHAYA GAZETA in Russian 26 Dec 81 p 1

[Article by N. Polukhin, secretary of the party organization of the mine imeni 23rd CPSU Congress of the production association "Roven'kiantratsit": "Punished for Success"]

[Text] The collective of the mine administration imeni 23rd CPSU Congress is the leader in Voroshilovgradshchina. It is famous for initiative and smooth work. For four five-year plans in a row it has not only fulfilled, but overfulfilled the assignments. During this time the country received over a million tons of above-plan anthracite.

The plan for this year was also fulfilled ahead of schedule. There was a triumphant meeting on this occasion. Representatives from other mines in the production association "Roven'kiantratsit" and the Ukrainian Communist Party gorkom honored the winners of the socialist competition.

The miners work under difficult conditions of thin beds. They have to solve vital questions of developing the enterprise. The most urgent problem is how to prolong the life of the mine. The miners thought about this even at the triumphant moment.

Mine No 81 was laid so that coal could be taken faster from the beds that are located near the surface. No one counted on its long life, therefore the rated output was low, only 300 T of coal per day and about 100,000 T per year.

But the collective computed differently. It increased the coal extraction seven-fold, by their own forces developed the mine and introduced new equipment. Other mines were included in the enterprise. They included "Kievskaya-Komsomolskaya" No 1 and "Kievskaya-Komsomolskaya" No 2 which were built by representives from the capital region. The mine administration that was formed in 1970 extracted over a million tons of anthracite. It was awarded the name of the 23rd CPSU Congress for its victory in the socialist competition. Reinforcing the success, the collective made it a standard to extract 1 million T of anthracite per year, and with a solid above-plan addition.

The miners did not stop with their achievements. They introduced grading and combine complexes in four longwalls. In a word, they tried to take the coal not by numbers, but by skill.

Judge for yourself. Whereas in 1960, 700 workers of the stoping face extracted 700,000 T, last year, 400 people produced over a million tons of anthracite. The work of the brigade of M. Zakharov succeeded, for example. Here every miner during his shift extracts 13 T of fuel. This labor productivity could be the envy of the brigades that are working much thicker beds.

Thirty-years-old, the mine was laid in 1950, is not very old, but it is sufficient for maturity of the collective. Labor dynasties have already formed here. Among them are the families of bearer of two Orders of the Red Banner of Labor, brigade foreman of the tunnelers V. V. Vasil'yev and bearer of the Order of the October Revolution V. V. Kolesnikov.

The miners are persistently introducing leading equipment, steadily increasing labor productivity and perfecting technology. But the powerful equipment rapidly works off the longwalls and "eats up" the coal reserves. One naturally has to think about the future. Back in the beginning of the 1970's, former director of the enterprise G. P. Kogut turned the attention of the Ukrainian SSR Ministry of the Coal Industry to this. They did not listen to him, insinuating that if the mine could produce a million tons of coal per year and more, then there was no need for concern.

The current director V. A. Tertychenko already in 1980 again raised the question of accelerated stripping of the new beds. Again nothing was done.

As a result, in early 1982 only slightly more than 2 million T of coal reserves remained at the 220-meter level. They are located 7-8 km from the shaft on shallow broken up sections.

The collective is searching for a way out of the situation. Another two beds have been found 300 meters deeper than those currently being worked. The total coal reserves here are almost 30 million T. Two inclined crosscuts 1,750 meters long each have begun to be tunneled to strip them. Roughly half of the work has already been done. It has all been done by the efforts of the collective. The planners have not selected the most successful variant. When the shafts will be ready, one crosscut will be occupied by a conveyer. The second one will have to be used to transport both equipment, construction materials and people. This is forbidden by the safety regulations. The miners raise the question to the sector headquarters: help the enterprise at the critical moment, examine the question of making a vertical shaft 520 meters deep at the industrial area of the mine "Kievskaya-Komsomolskaya" No 1. This will immediately undo the knot of problems. Reconstruction of the active enterprise will be much less expensive than building a new mine. However, nothing is being done.

The miners hope by their own efforts to make crosscuts to the lower beds in the first quarter of 1983, and then prepare 1-2 longwalls here in 1984. Now they are working at half force. But there is still time to make the shaft and give a second life to the enterprise, at the same time, encouraging the collective which is now in the position of being punished for success. The punishment is clear and unique it is true: the miners' needs are being answered with indifference. The development of a fuel and energy complex is a state matter. The opportunity of obtaining a solid addition of coal with the least outlays of funds by reconstruction cannot be missed.

Of course there are "wise counselors" who sometimes reproach the collective: why, they say, did you need to extract the coal at such rates, a million tons per year? You could have worked more slowly and now the mine would live for another two five-year plans. The miners refute such narrow arguments.

It appears that the Ukrainian SSR Ministry of the Coal Industry will finally ponder and solve the question of reconstructing the mine which has been working at full output for several decades, and preserve the harmonious collective, for this is a matter of conscience, if you like.

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CSO: 1822/107

PIPELINES

OUTLOOK EXAMINED FOR WEST EUROPEAN AND USSR ECONOMIC COOPERATION

Vilnius SOVETSKAYA LITVA in Russian 6 Feb 82 p 3

[Article by E. Kuzin, international reviewer: "West Europe and Natural Gas"]

> [Text] A reader of our newspaper P. Barsukov (Vilnius) because of the signing of the Soviet-West German agreement on the gas pipeline project asks us to relate what is the outlook for cooperation between West European capitalist countries and the USSR in this area. The international reviewer E. Kuzin answers the question of our reader.

The Soviet-West German agreement was signed in November of last year. According to this agreement the Soviet Union, starting in 1984, will supply for 25 years the Federal Republic of Germany with an average of 10.5 billion m^3 of natural gas per year. A similar agreement was signed in January of this year with France. It will receive for 25 years 8 billion m^3 of gas per year. The pipes, pumping stations and other equipment for the giant gas pipeline under construction will be supplied on credit by the firms and concerns of the FRG and certain other West European countries. This credit will later be paid by shipments of Soviet natural gas.

The Soviet-West German agreement was a part of a broader energy project. It should be said that increased interest by the West European countries of Soviet natural gas is explained by the complicated situation in the area of fuel and energy resources which may become even more critical in the future. In 1960, the demand by West Europe for primary energy was covered by its own resources only by 68 percent. By the end of the 1970's, this percentage had been reduced to 45 percent. This trend continues to be maintained.

There are two areas at the present moment in which natural gas already plays an important role. This is the communal sector and private houses in the countries of West Europe. They have consumed from one-third to half of all the natural gas which these countries have. Industry and power plants use the remaining part.

The transition of industrial enterprises to natural gas is being encouraged in every way in West Europe (this currently concerns transport as well), so that the demand for blue fuel constantly rises. The question arises of how to satisfy the increasing demand for gas in the future.

West Europe has its own reserves of natural gas. Fields are found in the North Sea, in the Netherlands and France. Extraction of natural gas rose here from 20 billion m^3 (1960) to 204 billion m^3 (1980). The results of geological exploration work in the basin of the Mediterranean Sea are very promising. However, only the Netherlands independently covers its own needs through its own resources. At the same time, the specialists predict that the Netherland reserves of natural gas will begin to be depleted in the visible future. Great Britain has also approached a state of autarchy.

Other West European states, including the FRG and France, cover more than half of their needs for natural gas (Spain and Belgium by more than 99 percent) through foreign sources. Despite the fact that it is possible to increase extraction in West Europe itself, one should expect that in the next two decades only half of all the needs will be satisfied through their own resources.

Efforts are currently underway for further transition of the West European economy to natural gas. Calculations of the specialists show, however, that even with a maximum increase in extraction and 100 percent fulfillment of all the agreements concluded for its shipment with regard for the growing demand, by the year 2000 West Europe will have a shortage of an average of 130 billion m^3 of gas per year. In order to correct this situation, a number of West European countries have tried to achieve corresponding agreements with the countries of North Africa and the Near East. However, they view the Soviet Union as the most reliable supplier of natural gas and support agreements with it in this area.

These real steps and plans of the West European countries to expand economic cooperation with the USSR encounter opposition of Washington which is continuing to follow a path of confrontation with the Soviet Union and because of internal events in Poland has adopted a number of new discriminatory measures in relation to our country.

The interests of mutually advantageous, peaceful economic cooperation between the states of West Europe and the USSR, however, go above the attempts of the current American administration to force them to abandon this cooperation. This is indicated by the concluded Soviet-West German and Soviet-French agreements.

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CSO: 1822/108

PIPELINES

QUESTIONS ON GAS PIPELINE CONSTRUCTION ANSWERED

Moscow KRASNAYA ZVEZDA in Russian 16 Feb 82 p 2

[Interview with G. Sudobin, deputy minister for construction of oil and gas industry enterprises of the USSR, with correspondent of KRASNAYA ZVEZDA; date and place not specified]

> [Text] Respected editorial staff!
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> At the November (1981) Plenum of the CPSU Central Committee, Comrade Leonid Il'ich Brezhnev named the construction of five gas pipelines as the central construction sites of the five-year plan: West Siberia-center of the country and Urengoy-Uzhgorod. Could you discuss them in more detail?
> Private Ye. Volkov.
>
> Deputy minister of construction of oil and gas industry enterprises of the USSR G. Sudobin answers the questions of private Ye. Volkov and other readers of KRASNAYA ZVEZDA in a conversation with our correspondent.

[Question] Grigoriy Nikolayevich, what is the general pattern of construction of gas arteries in the country?

[Answer] I will start from the fact that the builders of the distant underground gas and oil trunklines have recently noted a remarkable event: they have started to count the third 100,000 kilometer of pipelines they have laid. They have laid these pipelines on the territory of all the union republics of our vast motherland.

The five largest trunklines of the West Siberia-center of the country and the export Urengoy-Uzhgorod gas pipelines of which Comrade L. I. Brezhnev spoke at the plenum, the trunkline Urengoy-Vuktyl-Ukhta-Gryazovets-Moscow region has already been started up ahead of schedule. Its output is now approaching the rated. Line work has been completed ahead of schedule at the second gas pipeline Urengoy-Nizhnyaya Tura-Petrovsk. At the end of December, the final "red butt joints" were welded near Nadym and Ufa, and thus the main work was completed on this 2,730-kilometer route.

New facilities are ahead. The total length of the West Siberia-center of the country as well as Urengoy-Uzhgorod trunklines exceeds 20,000 km. Over 200 compressor stations with total output over 20 million kW will be built on them. A program of pipeline construction of unprecedented scales is being realized. These trunklines in their energy potential exceed the hydroelectric power plants of Angara and Yenisey taken together.

[Question] Grigoriy Nikolayevich, where is the shock front of the pipeline builders today?

[Answer] On the third route, the Urengoy-Novopskov gas pipeline which links the city of Perm', Ufa, Kuybyshev and Donbass. Here the collective from the trust "Kuybyshevtruboprovodstroy" has appealed to all trunkline builders to complete the line part of the entrusted section ahead of schedule, by the 112th anniversary of the birthday of V. I. Lenin.

A lot has already been done. Over 2,500 km of pipes almost 1.5 m in diameter have been received at the unloading stations. Two-thirds of the total length of the pipes has already been welded in sections, and over 700 km of pipeline have been connected into a solid line. A broad front of insulation and laying work is underway.

Ahead are the workers of the Transcaucasus administration and the trust "Kuybyshevtruboprovodstroy," where the leading collectives are the brigades headed by ex-soldiers G. Agadzhanyan and A. Bloshkin. Their intensive start is an impressive example for other collectives on whom the fate of the trunkline Urengoy-Uzhgorod, 4,465 km long depends. This route passes, in particular, through the cities of Nadym, Tyumen', and Cherkassy. On the section between Uzhgorod and Ivano-Frankovskiy, three construction parties have already landed. The Urengoy-Kursk, and Urengoy-Yelets routes are also waiting for their subjugators.

[Question] What are the specific nature and difficulties of these construction sites? What is necessary to overcome them?

[Answer] For the successful fulfillment of the set tasks, it is necessary to have the maximum concentration on the start-up facilities of capital investments, labor and material resources. I will say directly that this is not easy. The annual volume of construction of pipelines on swampy territories alone is 3,000-4,000 km, in regions of permafrost 400-600 km. The problem of round-the-clock construction, the problem of eliminating seasonal work gain a national nature in their scales and importance.

The Ministry of Construction of Oil and Gas Industry Enterprises in turn has approved for the 11th Five-Year Plan a target production of scientific-technical programs to create a set of machines, technology and organization of line-high-speed construction of pipelines under the most complicated natural and geological conditions. The plants of the ministry have already started series production of over 70 types of new machines and mechanisms.

Consequently, the sector feels an acute need for drivers of trucks, four-wheel drive vehicles, machine operators for pipe-layers, tractor drivers and bulldozer drivers. We need the following professions (about 80 of them): welders, medics, barge skippers, navigators who know the northern rivers, and divers.

[Question] Grigoriy Nikolayevich, until now we have been speaking about strictly production matters. I would also like to hear your opinion about the daily life, and cultural services of the builders.

[Answer] There is no doubt that well-organized daily life has the greatest importance in achieving high production indicators. One can cite many examples of model residential cities along the route. These are found with all modern communal conveniences, schools and kindergartens in the Transcaucasus administration, in the trusts "Kuybyshevtruboprovodstroy," "Severgazstroy" and certain others. Construction of gas-transport systems, especially now, in one energy corridor makes it possible to pass to creating residential cities at a new and higher level. We generally plan to build them in populated regions near the compressor stations for 500-1500 people. Construction of large settlements for a lengthy period will make it possible to set up everywhere comfortable conditions for the daily life of the route worker with the least expenditures. Hundreds of thousands of Soviet people have selected this difficult profession for themselves. Among them are many builders who have come to the oil and gas routes after routine service in the army and the navy. The soldiers are happy with the supplies at all of our construction sites.

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CSO: 1822/108

SITUATION AT MAIN GAS PIPELINE CONSTRUCTION SITES REVIEWED

Moscow IZVESTIYA in Russian 18 Feb 82 p 2

[Article by V. Ivanov, B. L'vov, and special correspondent of IZVESTIYA G. Panushkin: "Great Construction Project of the Five-Year Plan"]

[Text] We are faced with constructing and putting into operation five of the largest main gas pipelines West Siberia-central of the country, as well as the export gas pipeline Urengoy-Uzhgorod.

The Urengoy field has gas reserves exceeding 3-5-fold all the reserves of such gas-extracting countries as Mexico, Algeria, Canada, England, and Holland taken together. Increase in extraction of Urengoy gas by the end of the five-year plan will be equivalent to an additional production of 200 million T of oil. By the end of the five-year plan, the annual extraction of this field will provide an additional quantity of fuel, electricity and daily gas to the population and industrial cities where 40 million people live.

The sector builders during the five-year plan will erect about 9 million m^2 of housing for the gas workers, oil workers and geologists. They will construct for themselves almost 3 million m^2 of housing, including 2.2 million in West Siberia, or roughly double that of the 10th Five-Year Plan. It is planned to build a large number of children's and preschool institutions, hospitals, sanatoriums and dispensaries.

The total cost of the construction program of the gas pipeline is estimated at R 25 billion. This exceeds the expenditures for construction of BAM [Baykal-Amur Trunkline], KamAZ [Kama Automobile Plant], the Volga Automobile Plant, and "Atommash" taken together.

Our country is currently using gas to smelt over nine-tenths of the pig iron and steel, and producing the same quantity of mineral fertilizers, roughly two-thirds of all the cement, and a considerable part of the electricity. About 200 million Soviet people use gas in their daily life. When the new gas transport complex West Siberia-center of the country opens up, these numbers will rise even more.

West Siberia today is the main region for development of gas industry in our country. The gas extractors in northern Tyumenskaya Oblast yield about 200 billion m^3 of "blue fuel" in one year alone.

When the new gas transport trunklines open up, one of the strategic tasks of development of the USSR economy will be solved: intensive involvement in the national economy of the Siberian natural resources, significant growth in the fuel-energy potential of the country, and stable supply of first-class fuel to the industrial enterprises and daily needs of the population.

Implementing the historic decisions of the 26th Party Congress, the specific programs of actions designed by the November (1981) Plenum of the CPSU Central Committee, the builders of the gas trunklines are applying new strength to the mass socialist competition on the principle "worker relay race." Powerful main gas pipelines will lie on the territory of 27 oblasts and autonomous republics of the RSFSR, Ukraine and Belorussia. The local Soviets of People's Deputies can render significant help to the builders and are already rendering help where work is underway.

This article discusses how the situation is going at the central construction sites of the 11th Five-Year Plan.

I. It is surprising but it is a fact that in conversing with G. Chesnokov, we spent about an hour in his office, and during this time not a single call signal was heard from the telephones on the desk of the leader of the central dispatcher service of the Ministry of Construction of Oil and Gas Industry Enterprises.

"When do you expect the latest news from the route?" we asked.

"News?" our interlocutor was surprised. "But you have just written in your correspondent book notes about the situation at the construction sections of the Urengoy-Novopskov gas pipeline. Those were the latest data. However, while our conversation was taking place, many of them changed of course. In the last 40 minutes, our machine operators-excavators have increased the total length of the trench for the constructed trunkline more than a kilometer. During this time the collectives of the insulation-laying columns have traversed about the same distance."

To those not versed in dispatcher "secrets" all of this may seem fantastic: without using any means of communication, at the same time, the dispatcher knew about the situation in each of the sections of the 3,343-kilometer route. This "vision" is common for dispatchers. No, not using television, but because of daily analysis of many thousands of numbers which come on hundreds of radio stations and teletypes from the construction section of the central service of sector information, including the main information-computer center which is equipped with the latest computers.

Welding, trenches, insulation. These are the main positions which determine the total final result of the work of the route workers, the kilometers of constructed gas pipeline. Day after day, these data are carefully recorded for each section and construction-installation administration, trusts and central boards, and the ministry as a whole. In addition to this, for all the collectives they receive data of how much and what types of work have been done on the increasing results, and how much remains, and how much has been done in recent days. But all of this is not all that the dispatcher has under his daily control. He also controls welding of pipes into lines and shipping of these lines to the route.

Just as large rivers begin from small streams, so the data obtained from the sections of different types of work form in the final analysis a "picture" of the entire enormous construction site. The picture is clear and dynamic with all the advances, complexities and difficulties. As a result, this makes it possible to perform daily and rapid supervision of construction, and to achieve high production indicators.

The leading experience of the collective of "Kuybyshevtruboprovodstroy" and the Transcaucasus administration of pipeline construction is now being broadly introduced at the Urengoy-Novopskov route. These collectives were able to use their comprehensive production lines to achieve a stable "step": one kilometer of finished trunkline per day. This frontier was achieved on the Urengoy-Petrovsk route. It is now being opened. But the dispatchers were the first to notice the broad "step" of the current front-line collectives. They gave a timely "signal" to the supervising, technical and other services of the sector: "there are high and stable indicators at Kuybyshev and Syzran'." This also occurred with "loud Satarov," where one of the best welding-installing brigades headed by USSR State Prize laureate V. Satarov began to overtake other collectives engaged in assembling and welding pipe sections. It is no accident that daily information which comes from the route to the central dispatcher service becomes the basis for summarizing the weekly result to determine the winners of the socialist competition.

Thus, with the help of numbers alone, without leaving the office of the chief dispatcher of the sector, we made a trip over the route which now lies from the world-famous Urengoy to Novopskov, to Voroshilovgrad where the already active largest gas arteries of this country are converging into a unified assembly. We were able to "see" how the famous brigade of Boris Diduk is installing and welding the pipeline through the frozen swamps of West Siberia, how the columns of pipe length carriers of "Uralneftegazstroy" are traveling through the steep slopes of the gray-haired Urals, how the collective of the section "Tatnefteprovodstroy" headed by Hero of Socialist Labor I. Shaykhutdinov is preparing for crossing a marsh, how the Transcaucasus resident Arkadiy Arustamov is leading his insulation-laying column on the offshoots of the Zhigulya.

"This is our news," says the chief dispatcher saying goodbye to us. "If you are interested in the generalizing result of work for today and not only for the Urengoy-Novopskov route, but also other trunklines where the collective of the Ministry of Construction of Oil and Gas Industry Enterprises is currently working, this information will be present at 08:50 as always."

Welding, trenches, insulation. This is how the 16 pages of numbers begin, the report on the course of construction of the most important start-up facilities of the sector for the past day. These data are received by the government, the Gosplan. They will be cited by leaders of the ministry, party and trade union organizations. They are also needed by us, the journalists, in order to report to the IZVESTIYA readers that /by the morning of 17 February 1982 on the route of the Urengoy-Novopskov gas pipeline: 900 kilometers of trunkline have been welded into a line, 460 kilometers of trenches have been dug, and 370 kilometers of pipeline had been insulated and laid./ [passages enclosed in slant lines printed in boldface].

> II. The trunkline of which we have been speaking is only marked by a dotted line on the general plan for construction of main gas pipelines in the country. Its direction was defined on "blueprints" and "tracing paper" of the planners comparatively recently. Nevertheless, the route of the super gas pipeline of the planet Urengoy-Uzhgorod-West Europe is already beginning to live an intensive labor life.

Pioneer work has evolved everywhere on its almost 5,000-kilometer extent. Near-route roads are being built, clearings are being cut into the taiga and residential cities are being erected. The construction-insulation landing parties in the Siberian polar region, in the Urals and in the Carpathians have started to lay yet another transcontinental underground artery.

About 1,200 km of pipes have already been shipped over the northern sea route, on railroads and by truck and tractor rigs to the route. It has been reported from the Carpathian region that rotating welding has already been started at the construction sites: connection into pipe sections of individual pipes for their subsequent installation into a solid line.

The agreement between the USSR and the FRG which is the largest in the history of international trade and industrial relations, and which was signed on the eve of the visit of Comrade L. I. Brezhnev to this country, is finding material strength. The "gas-pipes" contract which has been correctly called the "deal of the century" is beginning to act despite all the sanctions and obstacles put in the way by the U. S. administration. The gas of the distant Siberian Urengoy will arrive at the West European countries on pipes which the FRG firms have already begun to supply. Certain other countries will also participate in the shipments.

The development of work on the route and its scope permitted B. Shcherbin, the Minister of Construction of Oil and Gas Industry Enterprises of the USSR, to announce with quite justified optimism:

"The West Siberian-West European gas pipeline will be built ahead of schedule stipulated by the contract."

All the previous experience accumulated by the organizations of the ministry indicate the reality of these words. In the 10th Five-Year Plan alone, the country built and put into operation over 50,000 km of long-distance main pipelines.

The rates adopted by the sector in the first year of the 11th Five-Year Plan are high. The volume of construction-insulation work on the whole for the sector rose by 10 versus the planned 5 percent. The West Siberian program has been successfully realized. Twelve thousand km of pipelines, 63 compressor and pumping stations, 3,400 km of cable and radio relay communications lines, 1.713 million m^2 of housing and other facilities have been started up.

The realization of such an intensive program for the development of the gas industry and gas transport provided in 1981 an increase in extraction of "blue fuel" by 30 billion m^3, including 7 billion above the plan.

The advances are indisputable, but with all of this success the sector has never been able to erect similar facilities in such short periods as the international gas pipeline West Siberia-West Europe. The features of this unusual route through several time belts are illustrated best of all by numbers. At the start of the trunkline, the builders are faced with overcoming almost 150 km of permafrost ground, over 700 km of swamps, over 2,000 km of forests, 545 km of mountains of the Urals and Carpathians, 561 large and small rivers with total length of underground junctions of 200 km. The large rivers include the Ob', Volga, Kama, Don, Dnieper and Dniester.The builders are faced with crossing highway and railroads 417 times.

In order to guarantee the rated output of gas pipeline, 32 billion m^3 per year, it is necessary to construct 40 compressor stations with total output of over 3 million kW in addition to the blind section.

At the same time, large-scale work remains to be done at the Urengoy gas field. This is primarily construction of units for comprehensive gas preparation of unusual unit output, 15 billion m^3 each. In the final analysis, they will provide an annual transport of gas of 250 billion m^3 from this field alone.

It is natural that such a construction situation requires especially advanced organization, technical and technological solutions. The organizational structure has already been verified by the practice of constructing the previous Siberian giant gas pipelines. At the Uzhgorod route, dozens of so-called comprehensive production lines are being set up. Each of them consists of a narrowly specialized subdivision and fulfills all work without exception to build and install and produce a completely finished section of gas pipeline which is ready for operation.

As for equipping these lines, they have been given highly productive domestic equipment created by Soviet scientists and designers, including heavy tractor-pipelayers produced by the Sterlitamakskiy plant. They are competetive in their technical characteristics with the known American machine "Caterpillar" whose shipments from the United States have been interrupted because of the so-called "sanctions" of President Reagan.

The cherished words "report about the position on the Urengoy-Uzhgorod route" are heard more often at the all-union selector meeting which discussed the work at the pipeline construction sites in the country. The numbers are gradually acquiring strength and are growing with specific work.

> III. A chain of unusual machines is moving slowly through a taiga clearing in the construction wake. Every few minutes this mechanized caravan is illuminated by fireworks of electric arc welding. Pipes are connected into a solid line, cycle after cycle.

A short pause, and a special rod unit advances rapidly from the shaft of the just-connected pipe, just like from a gun barrel. This rod unit maintains and directs the next pipe. A hitch made of two cars on a pneumatic track move along nearby towed by a truck tractor. They hold the power plant which feeds this complex, and the distributor. Minutes are counted and the machines again go to the original position. Welding of the next butt-joint has begun. The next pipe is immediately advanced on the rod-unit. Another moment and it is fastened on the bracing shoes of the centering guide. A protective casing is put on the seam and the automatic contact welding is turned on. A blinding glow of welding again flares up. The machine for cleaning off the finished seam moves behind.

This is how the mobile complex of mechanisms for electric contact welding called by the authors "Sever-1" looks like. It was created by the united efforts of the collectives from the Institute of Electric Arc Welding imeni Ye. O. Paton, special design office "Gazstroymashina," the All-union Scientific Research Institute for Construction of Main Pipelines, and other specialists of the Ministry of Construction of Oil and Gas Industry Enterprises, as well as the Ministry of the Electrical Engineering Industry, Ministry of the Machine Tool and Tool Building Industry, Ministry of Instrument Making, Automation Equipment and Control Systems. The essence of operation of the machine that was developed by the collective from the laboratory headed by Doctor of Technical Sciences S. Kuchuk-Yatsenko is that the ends of the pipes are heated and melted under the influence of an electric current. They are then pressed toward each other with force. The pipes are "fused" into one.

The formation of the welded seam has been automated. The basic parameters of the welding regime are changed with the help of command instruments according to a preassigned program.

The high thermal power put into the welded connection makes it possible to reduce the welding process of one butt-joint to only 4 minutes. The unit in an hour can connect 6-8 butt-joints. A welder would require a week to do this manually. Thus, during a shift of welding from individual pipes, up to 0.8 kilometers of finished trunkline can be prepared. Up to 2.0-2.3 km can be prepared from 3 pipe sections. The labor expenditures are about 48 man-days per 1 km of pipeline.

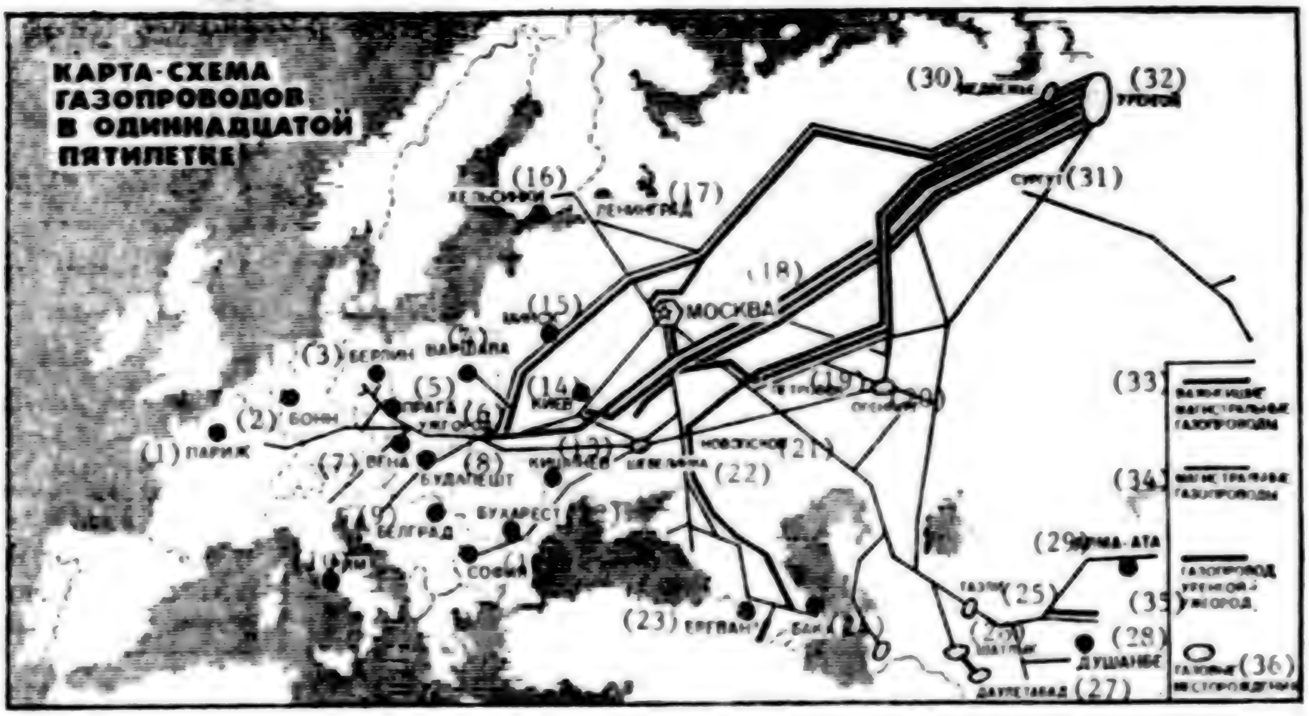

Figure. Map of Gas Pipeline in 11th Five-Year Plan

Key:

1. Paris
2. Bonn
3. Berlin
4. Warsaw
5. Prague
6. Uzhgorod
7. Vienna
8. Budapest
9. Belgrade
10. Rome
11. Sofia
12. Bucharest
13. Kishinev
14. Kiev
15. Minsk
16. Helsinki
17. Leningrad
18. Moscow
19. Petrovsk
20. Orenburg
21. Novopskov
22. Shebelinka
23. Yerevan
24. Baku
25. Gazli
26. Shatlyk
27. Dauletabad
28. Dushanbe
29. Alma-Ata
30. Medvezh'ye
31. Surgut
32. Urengoy
33. most important main gas pipelines
34. main gas pipelines
35. Urengoy-Uzhgorod gas pipeline
36. gas fields

Operation of the "Sever-1" unit has shown that automation of control of the welding process and control of the welding regimes guarantees the production of connection with stable high quality. Similar equipment for automating welding processes, in addition to comprehensive mechanization of all types of construction-insulation work will make it possible to fulfill the global technical re-equipping of the sector in the shortest times, and to increase the rates of line operations 1.5-2-fold.

Firms of the United States and Japan, by the way, have acquired licenses to produce the "Sever-1" complex.

A large quantity of the equipment needed to build the Siberian gas pipelines is produced at the plants of the ministry. This year alone over 70 types of new machines and mechanisms have been series manufactured for building main pipelines under any natural-climate conditions. These include powerful rotary excavators with output of over 1,200 m^3 of ground, including permafrost, per hour, and heavy pipelayers with lifting capacity of 50 T based on a domestic tractor, hydraulic dredges with digging depth to 25 meters and output of 300 m^3 per hour, all-terrain swamp vehicles "Tyumen'" on whose platform a powerful excavator can be installed, a welding base has been created, etc. It is curious that with lifting capacity of several tens of tons, this two-link machine with rubber-metal caterpillar tracks only exerts a specific pressure on the ground of 300 grams per square centimeter. Like a running skier! There is nothing surprising in the fact that "Tyumen'" traverses swamps in which the Canadian all-terrain vehicles sunk.

A no less important task however, is accelerated emergence onto rated productivity of the entire complex of gas pipelines. This is impossible without simultaneous construction of compressor stations together with the line section. The system of complete-block construction which has been developed and introduced in the Ministry of Construction of Oil and Gas Industry Enterprises makes it possible to successfully solve this problem. This system is based on very progressive principles of organizing production and includes a network of assembly-complete enterprises, specialized plants, transport-complete columns and mobile installation subdivisions. In other words, the future surface facilities, compressor and pumping stations, units of preparation of gas and oil are completely assembled at the fields in special container-buildings under plant conditions, and then shipped to the construction site in the assembled form. All the work is reduced to connecting them to the trunklines.

The complete-block method made it possible to reduce by 2-3-fold the construction periods for facilities of the oil and gas fields, and accelerated the emergence onto rated output of the main pipelines.

Traditional methods of building surface facilities by laying bricks with installation of the equipment at the site would have resulted in a need to hire 60,000-70,000 workers in the Tyumenskaya Oblast alone. The complete-block method reduced this number by more than half.

> IV. "Implement the large-scale program of advanced construction of main gas pipelines from Urengoy to the central regions of the country, as well as the export gas pipeline

> Urengoy-Uzhgord; put into operation each gas pipeline 2-3 months ahead of the set schedule."

These lines were written in the socialist commitments of the collectives from the Ministry of Construction of the Oil and Gas Industry Enterprises for 1982 and the 11th Five-Year Plan. They were quoted by the deputy minister for construction of oil and gas industry enterprises G. Sudobin in the beginning of our conversation. Speaking honestly, this announcement was initially somewhat optimistic: the entire length of the gas pipeline is 20,000 km. As though suspecting doubt, Grigoriy Nikolayevich confidently notes:

"The predictions are based on real calculations and practical experience. This is precisely why such intensive commitments have been adopted. This is the response of our collectives to the famous speech of Comrade L. I. Brezhnev at the November (1981) Plenum of the CPSU Central Committee, where these construction sites were called the central construction sites and the conviction was expressed that they will be completed on schedule without fail. As for the experience that was discussed above, I will present the following example. The first-born of the Urengoy power engineering arteries, the Urengoy-Gryazovets-Moscow region trunkline was put into operation ahead of the planned schedule. It is remarkable that the trunkline was put onto rated output in the same year that construction was completed.

Thus there are all the grounds for optimism and confidence in the successful implementation of the high commitments. This is confirmed by the practical work of our leading workers who are enthusiastically carrying the labor watch in honor of the 60th anniversary of formation of the USSR.

I will primarily name the USSR State Prize laureate B. Diduk from the trust 'Severtruboprovodstroy.' He is close to a new record, welding by the brigade of 150 km of pipeline during the winter construction season. His previous record was 130 km.

Production lines of Heroes of Socialist Labor A. Khaliullin of the trust 'Vostoknefteprovodstroy,' I. Shaykhutdinov of the trust 'Tatnefteprovodstroy' have also distinguished themselves. The results are high in the collectives of G. Agadzhanyan from the Transcaucasus administration of construction, N. Makarychev from the trust 'Kuybyshevtruboprovodstroy'."

"Grigoriy Nikolayevich, where is the shockfront of pipeline builders now?"

"Primarily at the next Urengoy routes, the Urengoy-Novopskov gas pipelines and the export Urengoy-Uzhgorod pipeline. Here there are all the prerequisites that work will be completed in advance of the state standard. Allow me to return once again to the sector socialist commitments. I will quote: 'Complete the line work on the Urengoy-Novopskov gas pipeline 3 months ahead of the established schedule. Lay no less than 1,500 km of pipeline in 1982 on the Urengoy-Uzhgorod route.' I recall that the length of the first of them with regard for the reserve lines is 3,570 km, and the second is 4,650 km. The schedule for opening of the trunklines is respectively: the first 6 months of 1983 for the first, and April 1984 for the second.

Because of the commitments at the Urengoy-Novopskov route, 900 kilometers have already been welded into the line, almost 400 kilometers have been insulated and laid, and 2,200 kilometers of pipes have been prepared for welding into the line.

Engineering preparation is underway with a broad front in the Uzhgorod direction: clearings have been made, route roads are being constructed, hundreds of kilometers of pipes have been shipped to the route, and their welding has begun.

The initiators of the competition for early opening of these trunklines of the subdivision of Glavtruboprovodstroy, for example, are striving to guarantee start-up of a large part of the sections entrusted to them already in the second quarter, and this is 880 km of the Urengoy-Novopskov gas pipeline, and to complete line operations almost on the 800-kilometer section Urengoy-Uzhgorod by the 60th anniversary of the formation of the USSR. The collectives of Glavsibtruboprovodstroy, the association Soyuzintergazstroy and certain others are also successfully working."

"Tens of thousands of builders have been concentrated on the routes. How and where do they live, and spend their leisure time?"

"There is no need to prove that there will be no stable production success without well-organized daily life, especially in the difficult route conditions. Many model route residential cities have already been created at the construction site. All the conditions for normal rest have been created in them. They have kindergartens, evening schools, recreation and reading rooms, and of course, medical stations, pharmacies and repair workshops.

In conclusion I would like to say several words about the participation in the great construction sites of the party, Soviet and public organizations of the oblasts and rayons through which the routes are passing. It has already become a tradition that when the main pipelines are laid, the oblast CPSU committees, ispolkoms of the Soviets of People's Deputies, trade unions and Komsomols focus a lot of attention on these important construction sites. The line workers have been given a lot of help in organizing the socialist competition, cultural-daily services, and material and technical supply. Cooperation on the principal 'worker relay race' was used to build mutual relations between the builders and the automobile transport administrations of the oblasts, autonomous republics, forestry farms, aviation enterprises and railroad administrations.

Our construction sites expect this help in the future as well. The operators will multiply their contribution. A lot depends on them, from technical inspection to equipment supply, removal of earth and clearing sections from forests."

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ROLE OF WEST EUROPEAN GAS CONTRACTS IN USSR ECONOMY EXPLAINED

Moscow LITERATURNAYA GAZETA in Russian 24 Feb 82 p 14

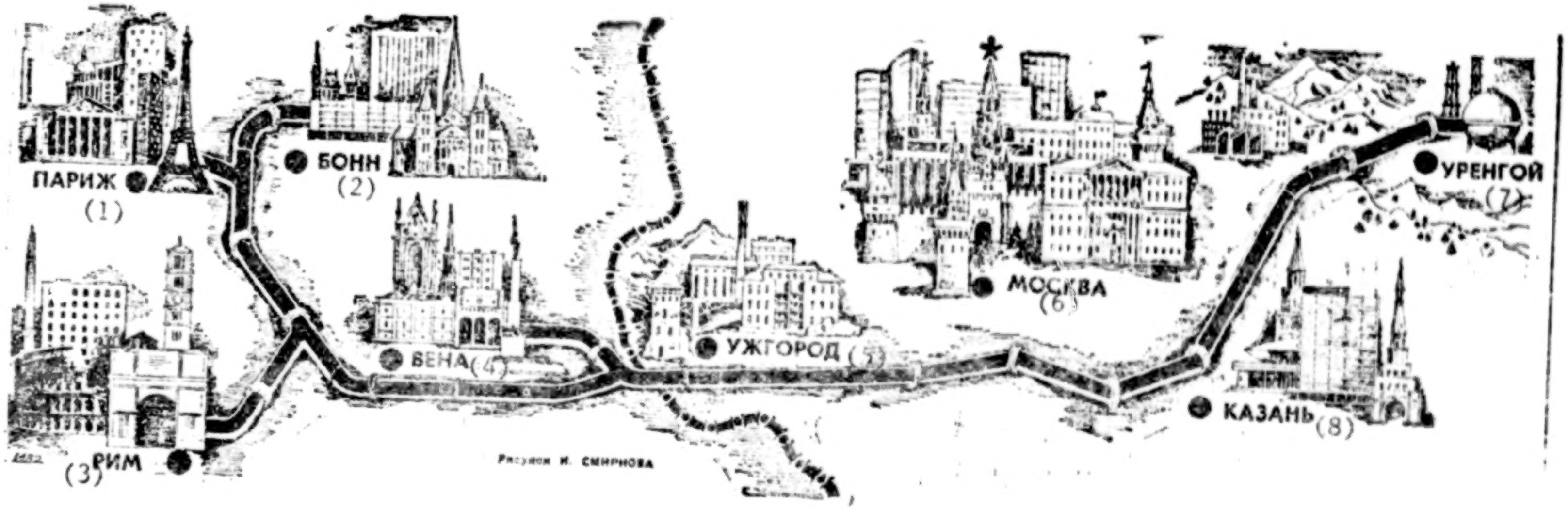
[Interview with Academician A. Aganbegyan, director of the Institute of Economics and Organization of Industrial Production of the Siberian Department of the USSR Academy of Sciences by Vladimir Vesenskiy; date and place not specified]

> [Text] The world press continues to actively discuss the recently signed contracts for supplying Siberian gas to West Europe. Our correspondent Vladimir Vesenskiy approached the director of the Institute of Economics and Organization of Industrial Production of the Siberian Department of the USSR Academy of Sciences, Academician A. G. Aganbegyan to express his opinion on the contracts concluded with the FRG and France, and to discuss the role and place of these gas supplies in the national economy. Here is what he said.

[Answer] First I will say several words about the natural resources of Siberia. Mikhayl' Lomonosov, our great compatriot, was a genius to foresee: "the might of Russia will grow because of Siberia and the north ocean." It is known for certain today, and has been scientifically and practically proven that three-fourths of the mineral hydroenergy and water resources of our country, almost 90 percent of the fuel and energy reserves are concentrated in Siberia and the Far East. These enormous resources are being more involved in the national economic turnover. The largest shift in the development of production resources to the east and north of the USSR is literally occurring before our very eyes. In other words, the task of developing these resources is being solved. It is the responsibility of the current generation of Soviet people.

As shown by historical experience, our country is capable of fulfilling this task with its own forces, based on its own equipment and technology. Under those conditions where the governments of the capitalist countries have prevented shipping certain equipment to the USSR, we have always set up our own production in a short time and escaped from the situation.

At the same time, mutually advantageous cooperation with other countries makes it possible to begin use of these resources in shorter time and with lower expenditures. International division of labor is therefore important and useful.



Key:
1. Paris
2. Bonn
3. Rome
4. Vienna
5. Uzhgorod
6. Moscow
7. Urengoy
8. Kazan'

Moreover, this cooperation provides an economic base for construction in politics and other areas, and strengthens mutual trust between nations.

In this respect, we the economists are especially interested in the recently signed "contracts of the century", as they are called, regarding shipments of Siberian gas to the FRG, France, and in the future, to other countries of Western Europe.

What part of the extracted gas from Siberian fields will we supply according to these contracts? A total of 155 billion m^3 of gas was extracted in 1980 in Siberia. By 1985, this extraction will rise according to the five-year plan to 356 billion m^3. The resources of West Siberia which comprise many tens of trillions of cubic meters make it possible to raise the level of this extraction three and more times. In addition, the presence of oil and gas accumulation in East Siberia has been proven, on the Siberian platform and in the Yenisey-Khatangskiy trough, as well as in Yakutiya. We have not yet begun to search for oil and gas in the interfluvial region of Lena and Indigirka which is very promising according to geological predictions.

It is common knowledge that our shipments provide for about 40 billion m^3 per year. This will be hundredths of a percent of the West Siberian reserves.

Development of the enormous resources of hydrocarbon raw material in Siberia is a large-scale natural basis for the development of broad cooperation from the USSR and foreign countries, including the countries of West Europe. It is my opinion that it is very natural to conclude a unique agreement regarding the construction of a gas pipeline which is the world's largest in length and its scale from the north Tyumen' field to West Europe. On the other hand, the USSR is the largest importer of pipes for construction and gas pipelines, and various oil and gas equipment. Cooperation is acquiring a broader scale for the formation of new complexes of petrochemical and gas-chemical industry, primarily in the Siberian regions. The potentialities of mutually advantageous cooperation are therefore truly enormous.

But it would be incorrect, as individual countries of the West do, primarily the United States, to interpret buying pipes abroad as a factor of dependence of our country on foreign technology. The USSR is the world's largest user of pipes, including those of a large diameter. It is planned in the 11th Five-Year Plan to switch to using gas pipelines of increased pressure, including multilayer pipes which were first developed by the Institute of Electric Arc Welding imeni Ye. O. Paton of the Ukrainian SSR Academy of Sciences. The USSR has also started to use the largest gas pumping units with output of 25,000 kW. This combination of scientific-technical and production progress in our country with the best and mutually advantageous foreign economic links is a characteristic feature of our economic development.

Long-term contracts with the West European countries which extend into the 21st century, in my opinion, are not only the largest "contracts of the century," but also another practical step on the path to fulfilling the decisions of the 26th CPSU Congress, the path to achieving strong peace on the earth.

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GENERAL

STRATEGY OF MANGYSHLAK DEVELOPMENT DETAILED

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 8 January 1982 carries on page 2 a 2,100-word article by S. Bayzhanov, Z. Saqiev and S. Khaydarov, the fourth in a series of five "Letters From the Mangyshlak Territorial-Production Complex," on the extent and developmental strategy of the complex. The Mangyshlak peninsula has been made over as a consequence of intensive development taking place there and the area is dotted with 20th century marvels: the first industrial atomic power station in the world; a fast neutron, breeder reactor; an atomic distillation unit for sea water; a thermo-electrical center; the largest plastics factory in Eurasia, entirely automated; the first gas-fixing plant in Kazakhstan; an automated petroleum industry; large compressor gas stations; petroleum gas and water lines; amazing cities and a full range of urban facilities. The authors describe these accomplishments in detail, particularly the gas-fixing plant, which processes natural gases formerly vented and wasted, and the plastics factory that is a primary user of the gas fixing plant's products. They stress the careful interconnection and coordinated management of Mangyshlak factories and resources that is part of a carefully worked out overall development strategy involving such things as extensive use of automatic production management systems, data links, multi-channel radio and television communication, careful cooperation between planning and other organizations involved and the use of the most up-to-date technology including earth resource satellites. The authors note that local reserves of oil are now estimated at 350 million tons.

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